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Contents

NO. 1, JUNE, 1938

Portrait of Charles W. Burr 2
Foreword 3
Experimental Observations on the Pathogenesis of Essential Hypertension . . . . *Harry Goldblatt* 5
Emotional Factors in Health and Disease . . *C. Macfie Campbell* 16
Section on General Medicine: Programs and Abstracts 35
Section on Public Health: Program and Abstracts 41
Sections on Ophthalmology, Otolaryngology, Medical History: Programs 45
Memoir of Judson Daland . . . . *Arthur C. Morgan* 48
Two Contemporary Manuscripts Bearing on the Death of Charles II of England . . . . *Edward B. Krumbhaar* 51
The Affair of the "1613" Printing of Johannes Rümelin's *Catoptron* . . . . *W. B. McDaniel, 2d* 60
Presentation of Portrait-Medallion of Henry H. Donaldson, the Gift of R. Tait McKenzie . . . . . . *R. Tait McKenzie* 73
Presentation of Two Additions to Our Harveiana, the Gift of Logan Clendening . . . . *Edward B. Krumbhaar* 75

NO. 2, SEPTEMBER, 1938

Recent Clinical and Experimental Observations in Adrenal Insufficiency . . . . *Russell M. Wilder* 79
The Cellular Organization of Nervous Function . *Detlev W. Bronk* 102
Section on General Medicine: Programs and Abstracts 118
Sections on Ophthalmology, Otolaryngology, Public Health: Programs 124
The Early Years of the Obstetrical Society of Philadelphia (*Part I*) *Lewis C. Scheffey* 125
Notes on the Mütter American Giant . . . *Joseph McFarland* 148
Census of Incunabula in the Library of the College 159
Lecture Schedule of the College, 1938–1939 194

NO. 3, DECEMBER, 1938

Cardiac Diseases, Infectious and Non-Infectious, in Relation to Public Health . . . . *Homer F. Swift and Alfred E. Cohn* 197

Contents

Should Psychoanalysis Be Purged? . . . . *Edward A. Strecker* 228
Section on General Medicine: Program and Abstracts 242
Section on Medical History: Program and Abstract 245
Sections on Ophthalmology, Otolaryngology, Public Health: Programs 247
Memoirs
David Hendricks Bergey . . . . *Joseph McFarland* 249
Henry Robert Murray Landis . . . . . *D. J. McCarthy* 254
Richard C. Norris . . . . *William R. Nicholson* 256
R. Tait McKenzie . . . . *Edward B. Krumbhaar* 260
Compensations at 70 . . . . *R. Tait McKenzie* 271
The Value of the Medical Library to the Social Historian *Richard H. Shryock* 282
The Early Years of the Obstetrical Society of Philadelphia (*Part II*) *Lewis C. Scheffey* 292

NO. 4, FEBRUARY, 1939

Some Reasons for the Recent Increase of Bronchial Carcinoma *William Boyd* 317
A New Filtrable Virus Associated with Respiratory Infection *Joseph Stokes, Jr., Athol S. Kenney, and Dorothy R. Shaw* 329
Proceedings of the College (*Authors and Titles*), 1938 334
Section on General Medicine: Programs and Abstracts 335
Sections on Medical History, Ophthalmology, Otolaryngology, and Public Health: Programs 337
Two Anatomical Fugitive Sheets . . . . *W. B. McDaniel, 2d* 341
Memoirs
George E. de Schweinitz . . . . *John T. Carpenter* 344
Edward Martin . . . . *William J. Mayo* 352
President's Address . . . . *George P. Muller* 355
Annual Reports: Library Committee, 364; Committee on the Mütter Museum, 375; Committee on College Collections, 376; Treasurer, 378
Official Lists: Presidents of the College, 387; Officers and Committees, 388; Officers of the Sections and Staff of the College, 390; Resident Fellows, 392; Non-resident Fellows, 415; Honorary Fellows, 417; Recently-deceased Fellows, 418
Index to Volume 6 419

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CONTENTS

Scientific Communications

Experimental Observations on the Pathogenesis of Essential Hypertension . . . . . Harry Goldblatt 5
Emotional Factors in Health and Disease . . . . . C. Macfie Campbell 16

Abstracts of Proceedings of the Sections

Section on General Medicine 35
Section on Public Health, Preventive and Industrial Medicine 41
Programs of the Sections on Ophthalmology, Otolaryngology, Medical History 45

Historical Communications

Memoir of Judson Daland . . . . . Arthur C. Morgan 48
Two Contemporary Manuscripts Bearing on the Death of Charles II of England . . . . . E. B. Krumbhaar 51
The Affair of the "1613" Printing of Johannes Rümelin's *Catoptron* W. B. McDaniel, 2d 60

Presentations of Gifts to the College

Portrait-Medallion of Henry H. Donaldson, the Gift of R. Tait McKenzie . . . . . R. Tait McKenzie 73
Two Additions to Our Harveiana, the Gift of Logan Clendening E. B. Krumbhaar 75

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Charles W. Burr, M.D.

Foreword

With this issue the Transactions signalizes its change to an annual volume comprised of four numbers. The extended title evidences, at the same time, the intention to widen the scope of the publication. The advantages sought are twofold: (1) more immediate reporting of the scientific proceedings of the College; (2) coördination and utilization of a patent interest in the College's rich heritage of cultural material.

The laboratories and individual workers in the field of the medical sciences, it is a truism to repeat, are unveiling with undigestible rapidity masses of new facts, as well as of hypotheses. These are brought to attention as rapidly as possible by means of a vast number of scientific periodicals. The functions of a college of physicians such as this may justly be thought to include the submission to its members of the most generally interesting, or the most striking, of these data produced by the research workers.

The annual series of eight lectures at the College of Physicians have for many years brought before the medical profession of Philadelphia some of the foremost medical scientists of the day. In recent years, though no effort was made to obtain from the speakers unpublished reports of their work, notably large audiences have been attracted to the meetings. In part, this must be attributed to the personalities of the speakers. But it is fair to assume, also, that many were attracted by the prospect of obtaining a succinct, authoritative interpretation of the status of the subject at that time. The primary purpose in increasing the number of issues of the Transactions is to bring these authoritative statements, in a short time, to a far larger audience than could possibly be expected to be able to attend any meeting on a given evening. In order to reduce to a minimum the time between the delivery and the publication of the papers, it is intended that the four issues shall appear, respectively, in the following months: April, June, December, February. Thus, the present issue is published in the month in which the second number of succeeding volumes may be expected to appear. Because of the delayed start of the present volume, the second number, normally scheduled for June, will appear in September; the third and fourth numbers, according to schedule, in December and February, respectively.

The addition of the word "Studies" to our title presages the inclusion, in this and future issues, of papers demonstrative of the traditional interest of the College in the cultural aspect of medicine—an interest which takes concrete form in the development of the College library, the Mütter Museum, and other historical collections. The Studies, based essentially on source material in the College, will serve, it is hoped, to integrate this interest and stimulate more research, as well as to make some appreciable contribution to the field of medical scholarship at large.

In the last quarter of a century one Fellow of the College has become, even while he lives, almost a legend for his generous and untiring activity in the development of the College's scholastic resources. The addition of the Studies makes the College's publication unique in this country, to the best of our knowledge. This development seemed logical in view of the College's resources and interest in the history of medicine. That it came to seem so must be attributed largely to the personal influence of this one man, Dr. Charles W. Burr. For this reason we find it appropriate, though his permission has not been sought, that our readers should see his countenance looking ahead—toward the new adventure so largely inspired by him.

Experimental Observations on the Pathogenesis of Essential Hypertension*†

By Harry Goldblatt, M.D., C.M.

(*From the Institute of Pathology, Western Reserve University, Cleveland, Ohio*)

It is generally recognized that hypertension may be of renal origin, but it is usual to limit this to the hypertension that accompanies chronic glomerulo-nephritis, obstruction of the urinary passages from various causes, polycystic kidney, renal pan-arteritis and severe renal amyloidosis. There are some authors, like Kylin (1, 2), who deny the renal origin of hypertension under all circumstances and who consider the various types of renal disease which accompany hypertension as secondary or merely coincidental. Most of the recent writers on the subject agree with Fishberg (3) that the benign phase of essential hypertension, usually associated with diffuse vascular disease (arteriolar sclerosis), that is, hypertension not associated with inflammatory or obstructive renal disease, is not of renal origin. The main arguments proposed against the renal origin of this type of hypertension are: (*a*) the frequent discovery of the elevated blood pressure before there are any recognizable signs of impairment of renal excretory function; (*b*) the fact that in a large percentage of these cases renal excretory insufficiency never does become manifest; and (*c*) the failure to find any anatomical signs of renal disease in some of these cases. Yet Fishberg (4), Bell and Clawson (5) and, more recently, Moritz and Oldt (6) have found that at autopsy there is organic arteriolar

* Mary Scott Newbold Lecture XL, College of Physicians of Philadelphia, February 2, 1938.

† These studies were supported by the Beaumont-Richman-Kohn Fund and by special grants-in-aid from the Josiah Macy, Jr. Foundation, New York, and Mr. Alex Wintner and Associates, Cleveland, Ohio.

disease in the kidneys of most individuals who have had essential hypertension with or without signs of disturbed renal function during life. In the reports of cases of essential hypertension in which no intrarenal arteriolar disease was found there is no proof that sclerosis in some portion of the main renal arteries was not the cause of renal ischemia. It seems, therefore, that the necessary conditions for the establishment of the possible renal origin of human benign essential hypertension, upon an experimental basis, would be the production in animals of hypertension, without impairment of renal function, by doing something to the kidneys that would reproduce the anatomical or physiological counterpart of arteriolar sclerosis.

Experimental evidence or proof for the view that the kidney may play a primary part in the development of hypertension has been sought in a variety of ways that have been summarized in a previous communication (7). Some of these experiments merely proved what is generally accepted, even for man, namely, the renal origin of hypertension associated with obstruction of the urinary passages or great destruction of renal parenchyma. However, those experiments that were designed to prove the renal origin of essential hypertension failed for several reasons: (1) They were acute experiments and yielded negative or contradictory results in the hands of different investigators using the same methods. (2) In most chronic experiments, the experimental conditions did not reproduce or simulate the anatomical or altered physiological state of the kidneys in benign essential hypertension. (3) Hypertension, when produced, did not persist.

This is the state in which we found the problem when we began our investigations 10 years ago, with the thought that the possible part played by the kidney in initiating essential hypertension should be susceptible of experimental proof on the basis of the following working hypothesis. If organic disease of the kidney be the initiating factor in the pathogenesis of benign essential hypertension, then this disease is, in all probability, the arteriolar sclerosis which is so frequently associated. If vascular disease limited to the kidney can be the primary factor in initiating this type of hypertension, then the production of the counterpart of the functional effect of such vascular disease, no matter how it is done, should result in the development of hypertension. Since there is no known way of producing arteriolar sclerosis localized to the kidney, it was thought that the best way to reproduce the functional effect would be the simplest. Because the main effects of arteriolar disease of the kidney are probably reduction of intraglomerular capillary pressure and reduction of blood flow to the functioning components of the kidney, it was felt that these two effects could be reproduced by constricting the main renal arteries as they leave the aorta. For this purpose, a special type of silver clamp was devised whereby the main renal arteries could be constricted and their lumen reduced to any desired caliber (8, 9).

In a series of experiments, by the use of this method, it has been found that in the dog constriction of the main artery of one kidney results in elevation of blood pressure which persists from weeks to months but usually returns to a lower or the original level within one month. The constriction of both main renal arteries at the same time, when adequate, results in persistent hypertension (9). The same persistent effect on blood pressure has been obtained by first constricting the main artery of one kidney and later constricting the main artery of the other (7, 9, 13) or by removing the other kidney (10, 11, 15). It has been shown that the hypertension which has been produced by this method in dogs (9, 12) and monkeys (13) involves elevation of both diastolic and systolic pressure. A similar effect can be obtained by constricting the aorta immediately above the origin of both main renal arteries (14). Constriction of femoral or splenic arteries (9), or the aorta immediately below the origin of both renal arteries (14), does not elevate blood pressure. Most of these results have now been fully confirmed and amplified by many investigators (5, *bibliography*).

When the constriction of both main renal arteries, or the aorta above their origin, is made moderate, there is no accompanying disturbance of renal excretory function, detectable by the usual studies of urine and blood, including clearance tests (9, 14). If the constriction is made marked from the beginning, disturbance of renal function usually accompanies the elevated blood pressure and the animal may develop fatal uremia (7, 9). In some of these animals there develops widespread terminal, necrotizing, fibrinoid and hyalinizing arteriolar disease, similar in all respects to that which is observed in the malignant phase of essential hypertension in man (15).

The mechanism of development of the benign or malignant phase of experimental hypertension due to renal ischemia has now been the subject of extensive investigation. In considering the pathogenesis of this type of hypertension it has been assumed, for the same reasons as for human essential hypertension (3, 16, 17), that the responsible mechanism is increased peripheral resistance. Since, in the experimental animals, this cannot be considered due to initial organic change in the peripheral portion of the entire vascular system, the problem narrows down to the cause of the functional increase of peripheral resistance which follows the constriction of the main renal arteries. The teleological explanation of purposeful increase of peripheral resistance in order to elevate the pressure and improve the blood flow through the ischemic kidneys is not susceptible of proof. There are therefore but two known mechanisms whereby the increased peripheral resistance can be produced, namely, either a nervous reflex from the ischemic kidneys, which affects the general vasomotor apparatus, or a humoral mechanism initiated by the ischemic kidney due to the formation or accumulation in the blood of a substance which, directly or indirectly, constricts the peripheral vessels. The possibility that such a substance might act by neutralizing a natural depressor substance must be mentioned.

That the ischemic kidneys are in some way directly responsible for the development of the experimental hypertension has been shown by the following experiments. If the main renal artery of one kidney is constricted and the ischemic kidney is removed some time later, when the blood pressure is still well elevated, the blood pressure falls promptly to the original normal level (7). If, instead of nephrectomy, the clamp on the one ischemic kidney is released or removed, the blood pressure also returns promptly to the original level (7). If the elevated blood pressure is first produced by the constriction of the main renal arteries of both kidneys, and only one clamp is released, the blood pressure falls slowly to a lower or to the original level in about the same time that it does when only one clamp is applied (7). If in a hypertensive animal both clamps are released, the blood pressure falls promptly to the original normal level (7). If one kidney is transplanted to the neck and the other kidney removed, constriction of the arterial blood supply to the transplanted kidney results in the development of elevated blood pressure (10, 25). Bilateral nephrectomy is not followed by the development of persistent hypertension (26–30, 7). These results constitute evidence that the ischemic kidney is responsible for the effect and that it must be present in the body in order to produce the hypertension.

The experiments that have been directed toward the study of the possible part played by a nervous reflex from the kidney have failed to establish this as the mechanism responsible for the increased peripheral resistance. In dogs, denervation of the renal pedicle (18, 19, 7), section of splanchnic nerves and excision of the lower four thoracic sympathetic ganglia (20), section of the anterior nerve roots from the 6th dorsal to the 2nd lumbar inclusive (21), excision of the celiac and upper lumbar ganglia (10), excision of the entire sympathetic nervous system in thorax and abdomen, including cardiac denervation (22, 23, 24), even pithing (25), have failed to prevent, or permanently to reduce hypertension produced by constriction of the main renal arteries. Finally, if one kidney is removed and the other kidney is transplanted to the neck or to the inguinal region, and its main renal artery is constricted, elevated blood pressure develops (10, 25). In such an animal there is no possible direct connection between kidney and nervous system. The results of these studies eliminate a nervous reflex from the ischemic kidneys as the responsible mechanism and leave only a humoral mechanism as the probable explanation of the phenomenon. These experiments do not eliminate the possibility that in human essential hypertension stimuli from the central nervous system may play an accessory part in elevating blood pressure above the level determined by the renal mechanism. It is probably this factor which is influenced by the usual medical treatment of essential hypertension and accounts for any fall of blood pressure which results.

The failure of the various surgical procedures carried out on the nervous system to affect experimental hypertension due to constriction of the main renal arteries is evidently due to the persistence of the renal ischemia which cannot be altered by these procedures as long as the clamps remain applied. These experiments do not in any way controvert the results that have been obtained by the same procedures in the treatment of hypertension in man. They do emphasize, however, the importance of the reduced blood flow to the functioning components of the kidney and reduced intraglomerular capillary pressure as the primary cause of this type of experimental hypertension and perhaps of human so-called essential hypertension that is associated with renal arteriolar disease. Since the renal lesion in human essential hypertension is frequently a thickening of the wall and narrowing of the lumen of the arterioles alone, without disease of the large arteries, improvement of renal circulation may result from these operations on the nervous system, due to relaxation of those arterioles in which the organic changes are not fixed. The lowering of blood pressure reported in about the same percentage of cases of hypertension by surgeons using various procedures which, directly or indirectly, affect the vasomotor nervous mechanism in the abdomen, may, therefore, be due to one cause, the improvement of the circulation through the kidneys, and not, as has been suggested by some, to the relaxation of the arterioles in a large part of the vascular bed of the abdomen. The latter view has no support in experimental observations.

All of the investigations that have been directed toward the study of the pathogenesis of this type of experimental hypertension have yielded results that indicate the existence of a humoral mechanism of renal origin that is responsible for the increased peripheral resistance which produces the elevation of the blood pressure (7). Removal of both kidneys does not result in elevated blood pressure, although the animal develops severe azotemia (26–30, 7). Complete occlusion of the main renal arteries of both kidneys also results in fatal uremia but the animal does develop hypertension (7, 10). Since occlusion of both main renal arteries does not eliminate all circulation to the kidneys, this indicates that a chemical substance might still be washed into the general circulation. That this is most probably the case is shown by the failure of hypertension to develop when both main renal veins are occluded at the same time that the main renal arteries are constricted or occluded (7). This is due, presumably, to the interference with the entrance of the hypothetical chemical substance into the blood stream. If the ischemic kidney from one animal is transplanted to the neck of a nephrectomized animal, the blood pressure of the latter rises almost immediately after the circulation through the ischemic kidney is restored. The transplantation of a normal kidney has no effect on the blood pressure (31, 32). This indicates that some chemical present in the ischemic kidney, when suddenly washed into the circulation of the recipient animal, produces an almost immediate pressor effect. Whether such a hypothetical effect substance actually exists and what its nature is has not yet been elucidated.

Several investigators (30, 33, 34) have reported a larger amount of pressor substance in the watery extract of ischemic kidneys in experimental hypertension and of the kidneys of human hypertensives as compared with that of normal kidneys (35). This does not constitute proof that this is the pressor principle involved in the production of hypertension which follows constriction of the main renal arteries or of essential hypertension in man. Attempts to demonstrate a direct pressor substance in the blood of animals with experimental hypertension have failed (33, 36). The results of tests made on the blood in human essential hypertension have been contradictory so that there is no conclusive proof of the existence of a pressor substance in the blood of such individuals (7, *bibliography*).

The possible part played by the endocrine organs in the humoral mechanism of hypertension has been the subject of investigation. Page and Sweet (37) have obtained contradictory results on the influence of hypophysectomy on this type of hypertension. Whereas the removal of the hypophysis had little or no influence in preventing this type of hypertension, yet hypophysectomy in hypertensive dogs was followed by a fall of blood pressure to a lower or normal level in some of the animals. The latter result may have been due to the development of adequate accessory circulation to the kidney and may not have been the effect of hypophysectomy. This investigation requires repetition.

The influence of the adrenals has also been studied (7). Briefly, the results have shown that bilateral adrenalectomy without supportive or substitution therapy prevents the development of hypertension due to renal ischemia and causes previously produced hypertension to fall promptly to the normal or to a subnormal level. The result is the same even when supportive treatment in the form of sodium chloride and sodium bicarbonate or sodium citrate are given to the adrenalectomized animals. However, when presumptive substitution therapy in the form of cortical extract, as well as supportive treatment, are given, some of the animals do develop elevated blood pressure despite the absence of both adrenals. That it is the cortex and not the medulla of the adrenals that is important in this connection is shown by experiments in which one adrenal was completely removed, the medulla of the remaining adrenal destroyed, and the entire cortex (9) or only a small portion of it (7) left just sufficient to maintain life. In such animals, the blood pressure became elevated in the usual way when the main renal arteries were constricted. The results of many of the above experiments have already been confirmed (11). Just how the cortical hormone acts is not elucidated by these experiments. It may act only by playing its usual part in the physiological mechanisms and insuring a normal state of the blood vessels of the animal. It may produce its effect by sensitizing the blood vessels to the action of the hypothetical effect substance of renal origin, or the reverse. The two substances may act synergistically. These are points that remain to be elucidated. What these experiments do indicate is the futility of surgical or other procedures designed to cure or lower hypertension in man by destruction or removal of portions of the adrenals (38, 39, 40).

SUMMARY AND CONCLUSIONS

Persistent hypertension, without accompanying disturbance of renal excretory function, like the benign phase of essential hypertension in man, has been produced in animals (dog and monkey) by moderate constriction of both main renal arteries or of one main renal artery and removal of the other kidney. This procedure reduces the blood flow to the functioning components of the kidney and probably causes a decrease of pressure in the intrarenal arterial system, comparable to the presumable effects of intrarenal arteriolar sclerosis. Hypertension with disturbance of renal function and the secondary development of terminal generalized hyalinization, fibrinoid degeneration and necrosis of arterioles, resembling the malignant phase of essential hypertension, has been produced by great constriction of the main renal arteries. The necessary conditions for the experimental production of the benign and malignant phases of essential hypertension have thus been satisfied. The conclusion appears justifiable that, contrary to the views of many recent authors on this subject, the benign and malignant phases of essential hypertension, associated with diffuse vascular disease, are of renal origin. This view is already being admitted as tenable for at least some cases of essential hypertension in which the pathological changes in the renal arteries and arterioles are obviously of adequate severity to account for renal ischemia (41).

The results of all the studies that have dealt with the pathogenesis of the benign and malignant phases of experimental hypertension due to constriction of the main renal arteries which resemble the benign and malignant phases of human essential hypertension, indicate that the hypertension is due primarily to a humoral, not to a reflex nervous mechanism, initiated by the ischemic kidneys. The nature of the hypothetical effective substance of renal origin responsible for inducing the hypertension has not yet been elucidated. Although a larger amount of a direct pressor substance has been extracted from ischemic than from normal kidneys, yet there is no proof that this is the responsible substance and its existence in the blood has not yet been demonstrated. The integrity of a portion of adrenal cortex adequate to maintain life is a necessary condition for the development of experimental hypertension due to renal ischemia. This fact and the results of other experiments indicate that the adrenal cortical hormone may play some part, in conjunction with the hypothetical effective substance of renal origin, in the pathogenesis of hypertension due to renal ischemia.

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Emotional Factors in Health and Disease*

By C. Macfie Campbell, M.D.

The psychiatrist when challenged to discourse on emotional factors in health and disease can hardly refuse to do so. Emotional factors are to a large extent the very stuff of his daily work. His patients may come to him because of emotional distress. Where other symptoms such as motor or sensory symptoms, morbid ideas, odd behavior are in the foreground, their roots may be found in the emotional life.

With this experience the psychiatrist may hope to contribute something to a discussion of the topic of this evening. A dreadful obstacle, however, stands in his way, that of language. His daily work has forced him to study human beings handicapped in one way or another, in distress, thwarted, striving in a confused way to attain unformulated goals, burdened by residuals from early experiences, facing the most diverse life situations.

He does his best to reconstruct the setting of the specific symptoms, to analyze the complex situation into simpler component forces, to deal with these factors in a constructive way. He studies the patient from the point of view of internal medicine; he tries to understand the individual personality from the study of his behavior and the account of his internal experience; he scrutinizes the actual life situation in which the patient is enmeshed and the past situations which have molded his personality. With good fortune the physician may be successful in grasping the significance of the symptoms, the nature of the forces involved, the practical steps to be taken.

One major difficulty remains, that of communicating his observations in language which will be acceptable to his colleagues. My task this evening is to discourse on emotional factors, and

* Read before the College of Physicians of Philadelphia, November 3, 1937.

I have no indication from your secretary as to his delimitation of emotional factors; nor do I know what license I have to deviate from the topic allotted to me. I must not abuse the occasion by giving a general discourse on human nature and its misadventures. Happy the specialist who has a well-defined vocabulary at his disposal, who works in a field where the terms are technical and explicit, who can given an ocular demonstration of the objects to which he refers, who can isolate the dynamic systems of which he talks! Unhappy the psychiatrist whose language is a blend of ordinary speech with its lack of precision, and of technical terms whose apparent precision masks misleading assumptions and great divergence of opinion!

In this dilemma the psychiatrist is entitled to appeal to the psychologist, as the internist may depend on the physiologist for the precise definition of fundamental life processes. The psychologist, however, has had his own difficulty in dealing with the topic that confronts us. He has found it no easy task to give us a body of doctrine on the emotions. William James (1) states:

> "As far as 'scientific psychology' of the emotions goes, I may have been surfeited by too much reading of classical works on the subject, but I should as lief read verbal descriptions of the shapes of the rocks on a New Hampshire farm as toil through them again. They give one nowhere a central point of view, or a deductive or generative principle. They distinguish and refine and specify *in infinitum* without getting on to another logical level."

He then gives us his own familiar formula: "the bodily changes follow directly the perception of the exciting fact and our feeling of the same changes as they occur *is* the emotion." Having given us this formula for the "coarser emotions" he proceeds to apply it to what he calls the "subtler emotions," under which he includes so-called moral, intellectual, and aesthetic feelings.

The formula of Lange (2) is equally simple: "we owe all the emotional side of our mental life, our joys and sorrows, our happy and unhappy hours, to our vasomotor system."

There are various reasons for rejecting these views as inadequate, but both views call attention to the intimate connection between the inner emotional experience of the individual and the complex processes of physiological regulation which accompany that emotional experience. Cannon (3) has studied these processes in detail, and taught us to think of the inner experience of fear or rage as merely one element in a personal reaction which involves complicated and highly adaptive physiological processes, in which endocrine glands, autonomic nervous system and viscera play the leading rôle. Cannon has also emphasized the rôle of the thalamus, disorders of which may not only induce pain but may, as shown by the observations of Head, modify in a very special way the pleasurable or disagreeable quality of various experiences. In cases with thalamic lesions, cutaneous stimuli of quite moderate intensity may have their pleasurable or unpleasurable quality much accentuated (e.g., "lovely, so soothing, so very pleasant"). Head (4) refers to a peculiar unilaterality of emotional experience described by some of his patients. One patient said he "could not stand the hymns on the affected side;" another found that "a horrid feeling came on in the affected side" when the choir began to sing.

It is evident that this region of the brain has much to do with the subjective experience of emotion. As to the expression of emotion, neurological experience has demonstrated that the inner experience of emotion may be dissociated from the mechanisms of the expression of emotion; in various neurological conditions behind a mask-like facies there may be vivid emotional experience, and explosive laughter and crying may take place in the absence of any corresponding inner experience of emotion.

The work of physiologists and of neurologists has thus shown that both emotional experience and emotional expression are liable to be modified in a special way by damage to the cerebrospinal nervous system, and that the neuro-endocrine system plays an important part in emotional reactions. We have learned many details about the intimate processes that go on within the body under conditions of emotional excitement, and in using the term *emotion* we are conscious of referring to a most complex system of psychological and physiological events.

With this information at our disposal we are not surprised to meet with patients whose physical symptoms are the most prominent or even the only indications of disturbing emotional experience, and with other patients whose emotional perturbations are the first indication of some underlying bodily ailment.

As to the influence on the emotional life of disturbances in the bodily economy, one may cite a few familiar facts. The menstrual function in many women is associated with emotional reactions and disturbance of mood. The pharmacological action of a drug may show itself most strikingly in its influence on mood and emotion. Some drugs, such as alcohol, promote transient euphoria ("give strong drink to him that is heavy of heart") and release underlying emotional mechanisms. In the acute psychoses of the chronic alcoholic with his impaired nutrition extreme fear is common. The early stage of a febrile disorder may be associated with euphoria (Bleuler); cardio-vascular disorders may precipitate anxiety; various abdominal conditions cause depression. In these cases the anxiety and depression are not merely the reaction of the personality to the actual pain and handicap of the bodily condition, but seem to be determined more immediately by the underlying somatic process.

Where the central nervous system is directly involved, mood and emotion may show modifications; in some cases of brain tumor one finds a rather facile good-humor; one may also refer to the euphoria of the general paralytic, and of the multiple sclerotic, the irritability and outbursts of rage of the epileptic.

In view of the preponderant attention usually given to the physical signs of disease, the variations in the emotional life have been less precisely noted and are less definitely established. Head (5) devoted unusual attention to this topic, especially in relation to visceral disease. He described transitory episodes in which patients with pulmonary and cardiac disease become rather sullen, keep back their tears with difficulty, may retire to weep alone. He relates these changes to the reflected pain of visceral disease. In this connection he defines his own use of the term emotion:

"This feeling of ill-being is in no way an emotion proper, for its main characteristic is the absence of projection. In anger we are angry at something or with somebody, and it is very doubtful if we are capable of anger without projecting it on to an object. This projection I believe to be a necessary part of every true emotion, such as anger, love, hate, and the like.

"But on the other hand, in the state I have attempted to describe, projection is absent or so slight that it is doubtful if, when it occurs, it is not a secondary change. For such a state we require a word in English psychological terminology. I propose, then, to use the word 'mood' to indicate a state of mind in which consciousness is dominated by feeling-tone but where the resulting state is not projected.

"The best example of the difference between a mood and an emotion is given by the two types of fear. In fear, an emotion, we are afraid of a thing. But there is no doubt that a state of fear can exist in which there is no fear of any particular object. This condition, which is common in the insane and in children, is a true mood. I believe it can also exist in visceral disease, but is usually so closely mixed up with hallucinations or other manifestations that it becomes peculiarly difficult to investigate."

Still more important from the point of view of the practising physician than the influence of impersonal bodily processes on the emotional life is the participation of the bodily systems in emotional experience. The physician who is not alert to the various ways in which the emotions express themselves in bodily symptoms may often seek in vain for a simple impersonal explanation of bodily symptoms. The physician must always remember that each bodily system not only has its specialized routine work to do, but is liable at any time to be mobilized in the interest of the organism as a whole when faced with some emergency or external situation of importance. The pattern of this mobilization is deeply rooted in the endowment of the individual; it may be elicited by an actual situation of immediate importance, or by some trifling stimulus which through past associations has gained unusual significance.

The variety of bodily symptoms, which have their origin in the emotional experience of the patient, may be appreciated by a glance at Dunbar's review (6) of the literature dealing with this topic over a period of two decades (1910–1933). Practically every system is represented, and the specialist as well as the general practitioner does well to keep in mind the importance of emotional factors.

The importance of emotional factors in cardiovascular disorders has been emphasized by Lewis A. Conner (7) in a paper from which I borrow the following observations. In many cases the symptoms and signs of disturbance of the cardiac function are the result of overt or repressed fear, while the organ is otherwise quite competent to meet all the ordinary stresses and strains which are imposed upon it in the way of ordinary work. Most laymen are extremely sensitive to the thought of heart disease and any suggestion of such an ailment tends to arouse an emotion of fear, whether conscious or unconscious. The behavior and conversation of the physician in the presence of the patient may be of the greatest importance. The slightest suggestion that the heart is impaired may stir up emotional reactions accompanied by cardiac symptoms. The symptoms may develop after the patient has heard some statement from the examining physician that the heart has a murmur or some irregularity, or they may develop on account of the extra attention given to the examination of the heart by a group of examiners. On the other hand, the invalidism of the patient may be the result of incidental symptoms of no objective importance; the skip of a beat, slight palpitation or dyspnea due to abuse of tobacco or to some recent illness. The unimportant initial symptom may, however, cause in the sensitized individual an emotional reaction which gives rise to well-marked and protracted symptoms.

A clerk, aged 22, complained of shooting pains in the precordial region, some shortness of breath and insomnia. The symptoms had been present for three years, during which time he had been unable to work. Careful physical examination showed that the heart was perfectly capable of performing its routine work; a systolic murmur over the pulmonic area was without significance. The protracted symptoms which had incapacitated the patient for so long had developed after an insurance examiner had called his attention to a heart murmur, and a physician consulted on account of this had taken it seriously and warned the patient against over-exertion. The fear of the consequences of the supposed heart disease gave rise to pains in the left side of the chest and occasional dyspnea, with the consequent invalidism.

The emotional experience need not be that of pending personal danger, but may have a somewhat more complicated psychological background. A woman of 50 had frequent nocturnal attacks with violent palpitation and rapid heart action which lasted an hour or two. These attacks only occurred when she was occupying her house in the country and never in her apartment in the city. A few months before the onset of the symptoms her husband had died in this country house during the night in a sudden heart seizure. Her own attacks never came on while she was awake but only during sleep and usually they seemed to follow a nightmare. A review of this whole situation was followed by cessation of the attacks. In this case the series of events is evidently more complicated than that of the young man threatened with heart failure, but the association of time and place with the emotional experience of the patient's bereavement seemed to have a direct bearing on the occurrence of the attacks.

In organic heart disease emotional factors may play a seriously aggravating rôle. A man of 45 for seven years had had a leaking aortic valve but without any symptoms although he was well aware of the condition. Ten days after the death of his son he had a sudden attack of dyspnea and precordial pain. Six weeks later, while brooding over the death of his son, he had a sudden attack of severe dyspnea with thoracic pain and fainting.

A similar combination of organic impairment and emotional tension is seen in the precipitation of an asthmatic attack, severe headache, or convulsive attacks by emotional situations.

In the above cases cited by Conner the fear or depression could be very easily traced to a definite situation of emotional value, but in many cases the underlying fear or anxiety is of more complex origin which can only be traced after a detailed analysis of the personality.

The gastro-intestinal system has its own part to play in emotional mobilization, and its routine functioning is apt to be disturbed by emergency situations, with overt or latent emotion, and by conditions of more protracted tension. Disgust tends to cause vomiting, fear may cause defecation, various emotions interfere with the motor and secretory activity of the gastro-intestinal tract. The general mood has its influence on the gastric secretion, which is favored by a pleasurable mood. A depressed mood is usually accompanied by loss of appetite, and such emotions as fear and anger interfere with appetite and reduce the gastric secretion. It is generally admitted by those who are working in gastro-intestinal clinics that in a large proportion of the cases, perhaps fifty per cent, the disorders of gastro-intestinal function are manifestations of emotional disturbance. The relationship of the symptoms to the emotional experience is in some cases very simple and direct. In other cases the gastro-intestinal symptoms seem to depend upon emotional experiences which are not clearly available to consciousness and which are rather obscure, difficult to trace and to formulate precisely. The relation of vomiting to a recent disgusting episode is fairly clear. Conditioned stimuli may also reactivate the vomiting. The actual situation with its special emotional values, with its dangers and its appeals, may favor the persistence of vomiting no matter what its origin, as in the persistent vomiting of soldiers after slight gastritis (cf. the "pernicious vomiting" of pregnancy). One has to allow for personal idiosyncrasy. Some people vomit with facility in reaction to a slightly disagreeable gastric sensation; others to emotional tension of varied origin. The athlete may vomit before a contest, the young man before a visit to his sweetheart, the schoolboy as a matutinal defense against school attendance. Some claim a relationship between gastric ulcer and latent fear. In mucous colitis and perhaps even ulcerative colitis emotional factors (fear, anxiety) have considerable importance. As in the cardiac patient whose attacks duplicated those of her husband, so marked emotional preoccupation with the fate of others may give rise to abdominal symptoms.

Various workers are making the attempt to trace a great variety of visceral symptoms to complex dynamic situations in the personality. The material is as yet not fully demonstrative, and in many formulations the simple concept of emotion becomes merged in a variety of dynamic systems.

Among the bodily systems which are specially related to the emotional life is the endocrine system, which plays an important rôle in the general mobilization of emotional experience. In this activity the adrenals play a central rôle, but in Addison's disease the emotional life of the patient does not seem to attract much attention. Much more striking is the relation of emotion to disorders of the thyroid gland. Cases of hyperthyroidism following emotional shock have been reported in large numbers, and in many other cases protracted emotional tension of complicated origin plays a rôle. The influence of hyperthyroidism on emotional stability is a familiar observation.

In many other diseases of independent origin emotional tension tends to induce attacks or exacerbations, e.g., asthma, megrim, psoriasis. The above observations may serve to illustrate physical symptoms of emotional origin such as are frequently met by the general practitioner or the specialist.

There are patients, however, who come to the physician not on account of physical symptoms which are the expression of emotional experience, but who come on account of the emotion itself. The patient may put the emotion forward as the important symptom. The emotional disturbance may be episodic or it may be a more or less continuous attitude. Thus the patient may have attacks of anxiety or fear, with comparative tranquillity between the attacks; the anxiety may be quite vague and diffuse such as Head refers to as objectless anxiety, a condition which he prefers to call a "mood" and not an "emotion." On the other hand, the fear may be precipitated by specific situations such as being on a high place, in front of an open space, in some closed space like an elevator, a subway or a hall. The disturbing emotion may be associated with the sense of guilt recognized by the patient as inappropriate and apparently without foundation. The emotion may be that of rage which surges up in a disturbing and excessive way, or it may be a jealousy which the patient himself considers unreasonable and unintelligible. The emotional experience of the patient may not fit one of the above patterns; it may be a blend or combination which it may take some time for the patient to describe.

An emotional experience or attitude may profoundly complicate the behavior or the thoughts of a patient, without its source being clearly understood.

A woman of 32 reproached herself for a variety of happenings where her reason told her that she was not at all at fault. She felt that she was responsible for the death of a relative after a surgical operation because she had been partly responsible for the choice of the surgeon; as a matter of fact, at an early period of her life she had an intense dislike of this relative. The patient felt that she might perhaps have been guilty of other serious crimes. During swimming she had inadvertently grabbed hold of a youngster; she felt that perhaps she had caused his death. The irradiation of this feeling of guilt spread over hypothetical as well as actual experiences; she developed the idea that an old sweetheart might have killed his wife, in which case she would be responsible for the crime. The feeling of guilt which was thus spread over such a wide field and was so easily attached to individual incidents had its source in various factors of her sexual life some of which she at first denied. There had been autoerotism in childhood, various sexual experiences before marriage, contraceptive practice with regard to which she had felt very guilty. The feeling of guilt had therefore an adequate basis in experiences partly repressed and poorly assimilated by the personality.

In such a situation, as in other cases of obsession, while the emotional reaction of the patient is an important element in the situation, an analysis of the symptoms forces one to pay attention to the general organization of the personality. One has to analyze the dynamic components involved in the sexual life of the individual and pay due attention to the conditioning value of the patient's early environment. In referring to the sense of guilt in such a case one is merely indicating one aspect of an extremely complicated dynamic system, including individual personality and social setting.

In the following case the emotion of rage was an outstanding feature. The patient, a minister in the fifties, was rather distressed by the feeling that unknown powers might take possession of him. He felt lawless, that he might become a villain, that he might do anything. His previous equilibrium, in which religious faith was the central element, was gone. He began to have unaccustomed outbursts of profanity; he damned his mule with vicious emphasis; he threatened to tear the heart out of his farm-hands; he was distressed by these outbursts of rage, was afraid to have any dealings with other people, and warned them of their danger. The equilibrium of this patient's personality had throughout his life been somewhat precarious, somewhat pretentious intellectual formulations and professional activity overlying crude and unassimilated basal trends.

Patients may show an obsessive fear of dirt in response to which they undertake unnecessary and excessive cleansing rites. Fear may not be the most appropriate term; the underlying feeling may be one of contamination, with an element of disgust and guilt as well as of fear. The experience at the root of the preoccupation with contamination is usually some form of sexual experience, with complicated emotional reverberations.

In other cases the morbid fear is not of suffering an infliction, but of actually doing something dreadful or unworthy. The fear may be vague as in the case of the irascible minister; in other cases the fear is of doing something rather specific. A familiar example of the latter type is the mother who is afraid that she may do something to her child, and who cannot allow scissors or other cutting instruments to be in the room in which she is with her child. The reconstruction of the situation usually shows that the thought of doing injury to the child has a certain fascination which becomes more intelligible when one understands the rôle which the child plays in the life of the mother. In the psychoses the crude underlying tendencies are apt to express themselves more directly; the woman may actually destroy the child.

In the gamut of emotions presented by nervous patients, that of fear or anxiety is perhaps the most familiar. As mentioned above, anxiety may occur in acute heart disorders, may be secondary to toxic factors; in the great majority of nervous patients no obvious somatic disorder is present. Freud (1894) was the first to emphasize the relationship between episodic and chronic anxiety and the sexual habits of the individual. Under conditions where there is a somewhat undue condition of sexual tension, certain individuals develop acute attacks of anxiety with the physical symptoms which accompany anxiety or fear—palpitation, dyspnea, diarrhea, dizziness, etc. Among the situations which involve disproportion between sexual tension and relief, coitus interruptus was especially stressed by Freud. Clinical experience justified this correlation of sexual tension or sexual conflict with anxiety in many cases, while the special rôle of coitus interruptus was probably exaggerated. Thirty years later Freud issued a somewhat more complicated formulation as to the origin of morbid anxiety. He now considered morbid anxiety as due not to the physiological condition associated with unrelieved sexual tension, but rather to the influence of old experiences in childhood in which a real danger had to be faced which had left a profound influence in the depths of the personality. The real danger as felt by the child was that of castration in view of incestuous libidinous desires and rivalry and also in view of autoerotism. Any experiences or situations in later life which tended to stir up subconscious memories of this old situation were liable to elicit anxiety. It would take one far afield to discuss this formulation with its associated speculative system.

Anxiety is a frequent symptom in well-marked psychoses; it is specially familiar in depressions of the latter half of life. In some of these cases the agitation and the apprehension seem to be closely related to conditions of sex tension. In other cases one gets no clear evidence of such a relation. The rôle played by underlying physiological processes, especially by the endocrine system, in these cases is far from being understood.

In the general run of mental disorders affective and emotional symptoms are prominent. The leading complaint of the patient may be of mental distress, of sadness or fear, of doubt or suspicion, or guilt. In other cases the emotional factor may not be so definitely stressed by the patient; the emotional disturbance may be more manifest in the behavior than in the subjective complaint of the patient. The physician in formulating the individual case of mental disorder has to make use of such ill-defined terms as urges, needs, native dispositions, conditioning factors, and deals with the attempt of the personality to attain satisfaction, equilibrium, adaptation. In such a formulation the simpler schemata of emotional and instinctive patterns do not carry one very far. One sees, however, in the complex clinical picture contributions made by the instinctive, emotional, affective factors that we have been discussing. The disturbances of the basic bodily functions may be the partial manifestations of complex emotional reactions. The utterances of the patient are determined by the underlying needs and dissatisfactions and cravings of the individual. The outside world is distorted by dominant emotions and is permeated by forces which are the projection of distasteful factors of which the patient may have no clear consciousness. What the patient sees in the outside world throws light on the medium through which the patient is looking at life, the medium of his own personality. The hostility of others, the flattering remarks, the loving approaches, the gross accusations, the crudely sensual images and utterances which the patient sees and hears indicate those elements which his own personality has found impossible to integrate and to assimilate. The study of the emotional factors in a psychosis, therefore, is a study of the psychosis in its totality, of an individual personality.

In one large group of psychoses the disorder of the feeling-tone of experience is in the center of the picture, the affective or manic-depressive psychoses. Here a constitutional factor is partly responsible for the characteristic episodes of depression and of exhilarated excitement. The deeper analysis of the personality in some cases throws light on the individual attack; in other cases it leaves the attack as obscure as an epileptic attack. As a matter of fact, those psychoses in which a depressive affect is the outstanding factor are not quite so homogeneous as we are accustomed to assume. The patients show a great deal of individual variation in the clinical picture. The word depression which may be applied to the whole group fails to do justice to the individual patterns.

To illustrate this point, I refer to a few cases which happened to be in the hospital at the same time and who were roughly classified as cases of depression.

An Italian, 49 years of age, depressed, afraid, restless, believing that he was in danger from a gang. He was a simple soul who had worked honestly for his family and been unemployed for two years; he was worried over finances, disturbed by a recent burglary and by a friend's hint that he should have filed an income tax. The situation justified the type of emotional reaction, if it did not altogether explain its intensity.

A Russian laborer of 39 with a lung abscess was depressed and felt very guilty because he had left another hospital against advice. He too was a simple soul, had had no relations with the other sex, but had built a bungalow for the "not impossible she." In this case one notes the feeling of guilt in addition to the depression, and has to evaluate the rôle of the serious physical condition.

An Italian housewife of 50 was admitted lamenting, wailing and apparently rather fearful. She had been suspicious of her husband and had made attempts at suicide. The condition had come on in a very trying economic and domestic setting; her husband was alcoholic, economic circumstances were marginal; while she was convalescing from an operation her house had burned down. She was discontented with the improvised and altered living arrangements and was uncertain about the behavior of her husband. In this case, as in the case of the Italian storekeeper, a series of trying circumstances led to a familiar type of emotional reaction, differing from the normal only in degree, the intensity of the reaction giving a measure of the patient's constitutional equipment.

In the case of a depressed housewife 52 years of age special features were her emphasis on physical complaints and her rather rude and accusatory attitude.

These cases serve to illustrate the inadequacy of our stereotyped words and formulae, and to emphasize the necessity of dealing with each case as an individual problem. To understand the individual case one has to make a dynamic analysis of the total personality. One may begin with the emotional or affective factors, but one is immediately led from this partial aspect to the concrete problem of the organization and adaptation of the human personality. In organic disorders the special mental symptoms are more or less secondary; in the affective psychoses there is a rather special type of instability; in the other large group of the so-called functional psychoses, the heterogeneous schizophrenic group, many cases seem to represent the striving of the individual for internal equilibrium, the presence of an underlying dissatisfaction, the reaching out for some tolerable resting place. In this groping attempt direction is largely given by feeling-values. This direction may lead the individual to regress to crude sensual indulgence, to discard hard realistic thought for facile autistic thought, to be false to reason; to a large extent the process is the vague groping for a goal, and the degree of attainment of the goal is measured by the patient in terms of feeling-value.

So far we have dealt with emotional factors in disease and have seen that in the causation and manifestation of human ailments they play a considerable rôle. We have seen that the emotions continually play upon our internal organs distracting them from their routine tasks, often imposing on them apparently erratic and disordered behavior, and if acting under cover misleading the individual himself and frequently his medical adviser. In mental disorders the physician is faced with problems of fear, guilt, suspicion, elation, shame and grief, and has to study their significance in relation to internal conflicts and external strains.

The happiness and emotional tenor of life in general depend largely on external circumstances over which the physician has little control; he can however help in modifying the internal factors which determine the mood and emotions of the individual and in turning his emotional endowment to the best account.

The emotional and affective endowment is what gives life its special value to the individual. The individual identifies himself more closely with his feeling and striving than with his faculty for symbolic representation. The inner life of feeling and striving seems the core of the personality, while the intellectual functions seem to be one of the various skills which make the striving more efficient, and which make available the varied sources of satisfaction. The intellectual skill in forming and manipulating symbols serves to keep us in touch with the outer world and helps us to dominate it, but that skill has significance to the individual as a form of self-expression, and as the condition of a satisfying inner experience. The values which he sees in the outside world are the reflection of the values of which he has immediate experience in his life of feeling.

The inner life of the individual is a flux or continuum with its special and varying quality of feeling, on which background there flash from time to time more limited and extreme patterns of feeling, accompanying the special response of the individual to specific situations. The emotional endowment contributes zest to life, determines interest in the outside world, and a many-sided sensitiveness to the events of social life. Within this chromatic and dynamic experience are many conflicting systems and tendencies.

One of the main conflicts in life is that between reason and feeling, between the head and the heart. Where feeling and emotion are strong, the dictates of reason may be swept aside. The emotions with their driving force represent the oldest dispositions in living matter, while what we call reason is a specialized skill of comparatively late development. Emotional reactions are prompt, powerful in emergencies, undiscriminating; thought processes are less dynamic, slower, more highly discriminating. Depth of emotion and its dynamic quality are assets to be carefully utilized, with certain liabilities attached. They add to the value of life to the individual, they are closely associated with his strivings. Where emotion leads to precipitate and imprudent action, it is not the strength of the emotion but the retardation or the inadequacy of the other aspects of mental activity that we regret. A more rapid activation of a wider group of associations, reference to a wider perspective in space and time and to a broader social background with its established values, would have elicited a more appropriate emotion and permitted a reaction in accord not only with the original dispositions of the individual but also with his acquired characteristics. Thus emotional forces instead of being squandered in a series of immediate and trivial tasks may be made available for giving effect to plans of wider scope and greater duration, which do justice to the social as well as to the egoistic needs of the personality.

If the emotions deserve attention in the interest of the placidity of our internal organs, and if they are of importance for the well-being and the satisfaction and the richness of the individual life, they also deserve some mention for their significance in social life. The factors that bind individuals together in social life and that determine the quality of social life are largely of emotional nature. The importance of the emotional factor in human relations is as a rule underestimated. In the family circle the play of familiar emotional factors, of love, jealousy, resentment is recognized, but the subtle blend of feelings, emotions, sentiments determined in the child's inner experience by its relation to the family constellation requires a delicate appreciation.

In the school the tendency is to provide information, to exercise memory and various intellectual skills, and thus to prepare the child for life; but the happiness and later efficiency of the child will be less dependent on the extent of its knowledge than on its emotional life, on its freedom from fear and unproductive resentment, and on its frank development of friendly and social feelings.

In industry and commerce, focussed on production and distribution and on technological methods, the human factor was at first scrutinized from a rather limited standpoint, that of the human machine; hours and wages, physical conditions of work, specific nature of movements performed in production, special arrangements of wage scales, physiological conditions of fatigue received much attention. It is only recently that one has begun to pay attention to the emotional life of the individual worker, to his reaction to his fellows, foreman and management, to his feelings of frustration and resentment, to feelings of affection, loyalty and self-respect.

In our social life the objective and rational aspect of situations receives much attention, efficiency is stressed, but the driving emotional forces are apt to be ignored. Abstract words are utilized, logical arguments are advanced, formulae are sought for and proclaimed. But the words may act through their emotional associations, not because they represent clear concepts; the arguments are a necessary and conventional parade but have little to do with the appeal of the orator to the emotional dispositions of his hearers; the formula which the statesmen find is merely a symbol to indicate that a temporary equilibrium has been established between conflicting emotional forces.

The importance of emotional factors in relation to physical health, the health of the individual personality, social health, receives increasing recognition. As the physician is beginning in the somatic ailments of children and adults to pay attention to the importance of the emotional background, so in schools the teacher is passing beyond the traditional pedagogic tasks to think of the emotional development of the child. In an official school document one finds the report of a council of teachers appointed to consider the training of the pupils' emotional life. One may quote an extract: "Only by increasing our insight into the child's emotional strivings and conflicts can we most effectively aid him to make his emotional life strictly subject to his mental and volitional life. The first approach then to training children's emotions would be increased appreciation among teachers of the emotional factors of personality." This committee suggested the topic of fear for discussion, but the scope of the investigation of this committee included such "emotions, emotional situations, or impulses" as "sensitiveness, self-distrust, affection, emulation, resentment, curiosity, submissiveness, jealousy, anger."

As evidence of the same trend in other fields it is gratifying to find that in commerce and in industry increasing attention is being paid to the native dispositions and underlying needs and emotional satisfactions of the individual worker to the end that he shall have an opportunity for a wholesome and satisfying life. It is to be hoped that a line of investigation which has proved to be of such importance for the welfare of the home, the school and for industrial life will be steadily pursued until it shows that it is of equal value in relation to the wider life of the community with its varied goals and complicated procedures. For this purpose to be fulfilled systematic research is necessary so that our present fragmentary knowledge with its lack of precise formulations may be developed into a sound body of doctrines, well documented and clearly formulated.

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Proceedings of the Sections

SECTION ON GENERAL MEDICINE

Regular Meeting, January 24, 1938

The Use of Sulfanilamide in Meningococcal Meningitis. Earl A. Daugherty, M.D.*

The Effect of Sulfanilamide upon the Bactericidal Activity of Fresh, Coagulable Human Blood against Beta Hemolytic Streptococci. Myer Solis-Cohen, M.D. and Edward Steinfield, M.D. (*Abstracted below.*)

The Use of Digitalis. William D. Stroud, M.D.

A Clinical Survey of Diabetic Acidosis. Joseph T. Beardwood, Jr., M.D. and Sydney Weinstein, M.D.*

Abstract

The Effect of Sulfanilamide upon the Bactericidal Activity of Fresh, Coagulable Human Blood against Beta Hemolytic Streptococci. Myer Solis-Cohen, M.D. and Edward Steinfield, M.D.

The validity of the experiments made on sulfanilamide with blood serum may be questioned, as blood serum contains no leucocytes and has been found lacking in bactericidal power. Inasmuch as a true indication of hemobactericidal power is not obtainable by incubating infected defibrinated blood at rest, doubt is also thrown upon experiments as to the effect of sulfanilamide on defibrinated blood employing the slide-cell method.

The authors studied the effect of sulfanilamide upon the streptococcidal action of fresh, coagulable blood, which has been shown to be superior to defibrinated blood.

Three or four drops of each of four dilutions of an 18 hour broth culture were placed in a small test tube and 5 to 6 drops of the patient's fresh coagulable blood were added. At the end of twenty-four hours' incubation, one loopful of the serum

* *By invitation.*

from each tube was plated and the presence or absence of growth noted.

Sulfanilamide was given by mouth to eight patients, of whom four had a hemolytic streptococcic infection and four did not. Persons with no streptococcic infection, who were not given the drug, were used as controls.

It would appear from the experiments that sulfanilamide has the power of stimulating, or developing, or increasing hemo-streptococcidal activity in some patients infected with beta hemolytic streptococci and in some persons not so infected. This activity may be so great that the blood kills all the cocci in a dilution of 1:1,000; or it may be less, killing them in a dilution of 1:100,000, but not in a dilution of 1:10,000.

Growth in all the dilutions occurred in the bloods of the controls.

Regular Meeting, February 28, 1938

MECHOLYL IONTOPHORESIS IN VASCULAR DISORDERS. Hugh Montgomery, M.D. (*Abstracted below.*)

GENERALIZED VASCULAR SPASM PRODUCED BY ERGOTAMINE TARTRATE. C. J. Zinn, M.D.,* B. I. Comroe, M.D.,* and J. Q. Griffith, Jr., M.D.

OBSERVATIONS ON SURFACE TEMPERATURES IN HYPER- AND HYPO-THYROIDISM. Charles L. Brown, M.D.

TULAREMIA, WITH A REPORT OF SIX CASES. Garfield G. Duncan, M.D. and John L. Farmer, M.D.*

Abstract

MECHOLYL IONTOPHORESIS IN VASCULAR DISORDERS. Hugh Montgomery, M.D.

Blood flow velocity in a hand was measured before, during, and after the introduction of β-methyl acetyl-choline chloride (Mecholyl) into the hand by iontophoresis.

A plethysmograph was used to estimate blood flow by suddenly occluding the venous outflow at the wrist and recording the rate of increase in limb volume. The plethysmograph was utilized as the electrode by guarding the hand from the metal parts and

* *By invitation.*

attaching the plethysmograph to the positive pole of a galvanic machine. Blood flow increased within a few minutes from an average of 4cc./100 cc. of hand/minute to 22 cc. as a result of mecholyl iontophoresis: the increase lasted for from one half hour to two hours (9 experiments).

Eight controls were run: no increase in flow was produced (*a*) in the opposite hand, (*b*) by mecholyl alone, or (*c*) by current alone. Mecholyl plus current always increased blood flow, confirming the claim of R. Kovacs and J. Kovacs based on reddening of the skin, increase in oscillations, and increase in blood cell velocity through capillary loops.

Kovacs, and Kovacs and others, have reported conspicuous improvement in some peripheral vascular disorders with mecholyl by iontophoresis. The present work confirms this in 7 of 8 ulcers refractory to usual treatment, in all 6 cases of chronic thrombophlebitis, and in 2 of 4 cases of scleroderma.

Regular Meeting, March 28, 1938

FATAL OBSTRUCTIVE UROPATHY TWENTY YEARS AFTER RIGHT NEPHRECTOMY AND SIXTEEN YEARS AFTER DECAPSULATION OF THE LEFT KIDNEY. Simon S. Leopold, M.D. and Boland Hughes, M.D.*

ALLERGIC PURPURA—REPORT OF A CASE. J. A. Clarke, Jr., M.D. and Samuel E. Rynes, M.D.* (*Abstracted below.*)

A GENERAL REVIEW OF THE STATUS OF ALLERGY IN THE URINARY TRACT. Charles A. W. Uhle, M.D. and Malcolm W. Miller, M.D.* (*Abstracted below.*)

SO-CALLED CHOLANGEITIS LENTA: REPORT OF A CASE DYING WITH ULCERATIVE ENDOCARDITIS. O. H. Perry Pepper, M.D. (*Abstracted below.*)

Abstracts

ALLERGIC PURPURA—REPORT OF A CASE. J. A. Clarke, Jr., M.D. and Samuel E. Rynes, M.D.

The association of purpura and urticaria was reported as early as 1808. Schoenlein, Henoch, and Osler were early observers of this condition. Alexander and Eyerman in 1929 were first

* *By invitation.*

to employ the term "allergic purpura." Three etiologic factors have been stressed in this condition: food, drug, and bacterial allergy.

Evidence for food allergy has been mainly derived from "elimination diets." No definite relationship between positive skin tests to foods and the production of purpura has been established. Drug allergy incriminates, particularly, sedormid and quinine. In bacterial allergy causing purpura, foci have been found in the teeth, tonsils, sinuses, and gastro-intestinal tract.

A case exhibiting urticaria, angioneurotic edema, purpura, colic, and hematuria in a young man previously subject to hay-fever is reported. Although this patient reacted positively to a number of foods, as well as to ragweed and house dust, it was impossible to indicate any particular factors responsible for his symptoms. He responded fairly well to elimination of the positively-reacting foods and stock vaccine injections.

From the evidence presented in the literature and our own observations, it is our belief that purpura results from the direct action on the capillary wall of some substance previously tolerated without symptoms. This is an allergic reaction. However, cutaneous skin tests with water-soluble antigens are rarely, if ever, helpful in diagnosis.

Some other method of testing must be developed. Until that time a careful history, particularly of ingested drugs, and the old trial and error method must be depended upon for etiologic diagnosis.

A General Review of the Status of Allergy in the Urinary Tract. Charles A. W. Uhle, M.D. and Malcolm W. Miller, M.D.

Allergy assumes such an important rôle in medicine today, that clinical signs and symptoms, unrelated and unexplained by any tangible factors, are frequently classified as allergic in origin.

Renal colic has been recently observed in individuals with associated allergic manifestations. History, relief of pain by adrenalin, and negative urological studies, suggested an allergic etiology. These cases prompted a careful survey of the current literature bearing on allergic phenomena in the urinary tract.

Such review, although disappointing in respect to experimental evidence, has brought to light a surprising number of case reports dealing with urinary tract symptomatology relieved by recognized allergic therapy.

The majority of cases observed have been concerned with bladder symptoms such as frequency, dysuria, etc. There are, however, a number of interesting cases dealing with hematuria, hemoglobinuria, and renal and ureteral colic.

A number of significant factors have been noted: 1. Elusive urinary tract complaints have been frequently associated with recognized allergic manifestations in other tracts. 2. These urinary symptoms have been relieved by adrenalin or by the removal of offending substances, and may be reproduced by exposure to these substances, which, in the majority of instances, have proved to be food stuffs. 3. There is insufficient proof of the existence of allergic reactions in the urinary tract, but available clinical evidence is suggestive of such possibilities. 4. Allergic study of elusive urinary complaints is warranted and should be carried out more completely and more frequently.

So-Called Cholangeitis Lenta: Report of a Case Dying with Ulcerative Endocarditis. O. H. Perry Pepper, M.D.

The term *cholangeitis lenta* has been used in European literature, during the past twenty years, to describe a primary, usually streptococcic, non-suppurative cholangeitis. Numerous articles in German and Italian point out the analogies between the condition and endocarditis lenta. No article on the subject has appeared in English nor has the term been accepted in this country. The analogies include (1) the streptococcic etiology, although not all of the cases reported as cholangeitis lenta have been due to the Streptococcus viridans, nor even to streptococci; (2) non-suppurative nature of the pathologic process; (3) the clinical picture of slow sepsis; (4) splenomegaly, et cetera. One very distinct difference lies in the prognosis—for many instances of this type of cholangeitis recover, while others go on to the picture we call biliary cirrhosis.

Not all of the writers have approved this term, but no one has suggested a better one. There is no doubt that the cases of cholangeitis to which the term *cholangeitis lenta* has been applied do differ from what is usually meant by acute infectious cholangeitis. By that term is usually meant an infection of the bile ducts, secondary to gall stones or common duct obstruction, usually leading to suppuration; and caused by either streptococci or any of a number of other organisms. By cholangeitis lenta is meant a primary infection, perhaps of ascending nature, usually due to Streptococcus viridans and with the same lack of marked systemic reaction, such as leucocytosis, as is the case in endocarditis lenta. This type of process has certainly been neglected in our textbooks and system articles, so that, even if we disapprove of the term *cholangeitis lenta*, we must agree that attention should be drawn to this condition and to the European use of the term.

The case which aroused my interest in this subject was unique in that in addition to having a cholangeitis, which closely resembled the picture to which the term *cholangeitis lenta* has been applied, the patient also developed, on an old rheumatic valvulitis, an acute ulcerative endocarditis which in many ways resembled the picture to which we used to apply the term *endocarditis lenta*. Autopsy confirmed the presence of the two processes.

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SECTION ON PUBLIC HEALTH, PREVENTIVE AND INDUSTRIAL MEDICINE

March 7, 1938

MASKS AND THE PREVENTION OF AIR-BORNE INFECTIONS. Philip Drinker, B.S., Ch.E.* (*Abstracted below.*)

RECENT STUDIES ON IMMUNITY TO AIR-BORNE INFECTIONS. Joseph Stokes, Jr., M.D. (*Abstracted below.*)

PREVENTION AND CONTROL OF AIR-BORNE INFECTIONS. William F. Wells, B.S.* (*Abstracted below.*)

Abstracts

MASKS AND THE PREVENTION OF AIR-BORNE INFECTIONS. Philip Drinker, B.S., Ch.E.

The commonest cause of industrial disease is the breathing of atmospheric impurities either as dusts or as gases. There are four distinct types of ailments caused by breathing dusts: (1) toxic dusts, such as lead, radium, cadmium, and manganese are more apt to produce their characteristic reactions if breathed than if swallowed; (2) silicosis is the result of breathing dusts high in quartz content; (3) metal fume fever is a protein-like reaction simulating that which often follows an inoculation against typhoid fever. It is caused by breathing certain metals or metallic oxides. (4) Workers often become sensitized to the inhalation of certain dusts and give allergic reactions which are analogous to those of ordinary hay fever.

The inhalation of various concentrations of gases and vapors met industrially produce a wide variety of reactions, ranging from the severe lung edema caused by chlorine to mild anesthesia caused by gasoline vapors. The effects of breathing such different vapors as those of carbon tetrachloride, aniline, and benzol are well known industrially.

In industry it is common practice to apply ventilation as the basic method for control of both dusts and gases. In addition,

* *By invitation.*

it is often necessary for workmen to wear masks of various types as a sort of secondary defense, ventilation being the primary defense. As a result, industry today uses masks which protect against all combinations of dusts and gases.

The tests used for determining the effectiveness of the modern types of masks used in surgery and medicine are less effective and much less stringent than those applied to industrial masks. In the speaker's opinion, it would be well worth while for those interested in the development of medical or surgical masks to profit from industrial experience by adopting some of their test procedures and manufacturing experience. Surgical masks generally must protect against both inhalation and exhalation, while industrial masks protect only against inhaling impurities. Furthermore the medical masks probably should protect against air-borne viruses in addition to droplets expelled by coughing, sneezing, or loud talking. The test procedures at present used ignore the possibility of breathing bacteria from droplets or of air-borne viruses. From the industrial standpoint, it should not be difficult to devise comfortable masks which would accomplish these objectives and allow the wearing of ordinary spectacles.

Recent Studies on Immunity to Air-Borne Infections. Joseph Stokes, Jr., M.D.

Towards the end of the last century interest of public health authorities centered about the control of water-borne infections. A decade later milk-borne infections became their major interest, and a little later public health interest revolved more particularly about insect vectors.

Within the past decade, however, the idea propounded originally by Pasteur that infectious diseases were probably air-borne has been given added impetus by the recent work of the Wellses. Pflügge's theory of the transmission of infectious diseases chiefly by droplets became no longer tenable when the development by W. F. Wells of an air-centrifuge for determination of the number of bacteria per cubic foot of air revealed the large floating bacterial population of the air, and the presence of highly infectious "droplet nuclei."

Ordinary methods of "air-conditioning" have attempted, chiefly by filtering, to eliminate large particles from the air; but probably the first major advance in affording relatively uncontaminated air to human beings was made by Chapple in the development of an incubator for premature infants, controlled as to temperature and humidity, and obtaining filtered air free from pathogenic bacteria from outside of the building.

In tests conducted at the Children's Hospital on air within and without the incubator the air in the incubator, as obtained by the air-centrifuge, contained approximately 5 bacterial colonies per 5 cubic feet of air, the air from without the building approximately 20 bacterial colonies per 5 cubic feet of air, and the air in the infant ward around the incubator approximately 420 bacterial colonies per 5 cubic feet. The filtering of large particles from the air as it entered the incubator accounted for the difference between this air and that from outside of the building. Air-borne cross-infections in premature infants may be eliminated in this way.

A further development of this method of control of cross-infections is contained in the "Cabinet Cubicle" also being developed by Chapple at the Children's Hospital for full-term infants during the major portion of infancy. Such cubicles possess advantages similar to the incubator mentioned; namely, an air-lock for admitting bottles, etc., arm-holes with sleeves for handling the infant, individual temperature control, and air from outside of the building which is probably free from pathogenic micro-organisms. Also in large wards for older infants and children there is the possibility that the bacteria and viruses in the air breathed can be rapidly inactivated by ultra-violet light of certain wave-lengths as shown by the Wellses in their more recent studies. The types of lamps and installations best suited for such inactivation are still being studied. However, already certain clinical applications suggested by the Wellses and installations devised for operating rooms and for the prevention of cross-infections in hospitals for contagious diseases have appeared to be successful in preliminary trials. Many other clinical applications are being studied at present and the results will be reported later.

Prevention and Control of Air-Borne Infections. William F. Wells, B.S.

The Laboratories for the Study of Air-borne Infection, newly established at the University of Pennsylvania, advance the hypothesis that the microbic content of the air of enclosed spaces arising from common occupancy constitutes a hygienic hazard. Irradiation with ultra-violet light provides the most effective means so far proposed by which microörganisms may be eliminated from the air of occupied spaces.

Methods of testing the bactericidal efficiency of ultra-violet lights installed according to the following principles were discussed: (1) *Irradiation of re-circulated air.* The equivalent sanitary ventilation by this means is limited by the rate of re-circulation, i.e. the change in the room air is a percentage reduction of a percentage re-circulation. The method is applicable to special cases, such as the air of railroad cars, where the rate of re-circulation is high, occupancy load high and space greatly restricted. (2) *Direct irradiation of room air.* This method is highly effective, but is limited to special cases where the eyes of the occupants can be protected, as in operating rooms. (3) *Partial irradiation.* The general problem of sanitary air control must be solved by partial irradiation, where the space above the eye level of the occupants is directly irradiated. The disinfection of air in the room depends upon the air movement through the irradiated space as well as upon the spatial distribution of the radiation. Dispersed reflection provides an effective means of combining indirect with direct radiation so as to obtain the former's advantages without its greatest disadvantages. (4) *Light barriers.* A barrier or screen of ultra-violet light may be thrown across a hospital corridor to separate two contagious diseases; cubicle partitions may be extended by a light-screen along the top; open doors between rooms or cubicles and corridors along which microörganisms drift may be "closed" to such infection by a screen of ultra-violet light.

SECTION ON OPHTHALMOLOGY†

Regular Meeting, January 20, 1938

Coloboma of the Macula. Andrew Knox, M.D.

(A) Essential Shriveling of the Conjunctiva (Ocular Pemphigus); (B) Tuberculous Kerato-uveitis Associated with Distinctive Type of Cutaneous Tuberculosis in the Negro. Joseph V. Klauder, M.D.

Detachment of the Retina. Algernon B. Reese, M.D.*

Regular Meeting, February 17, 1938

A Case of Bilateral Annular Pigment Line on the Posterior Capsule of the Lens Associated with Krukenberg's Spindle. William Zentmayer, M.D.

Delayed Removal of Foreign Bodies from Vitreous: Report of Three Cases. Charles R. Heed, M.D.

The Late Results of Cervical Sympathectomy in Retinitis Pigmentosa. Edmund B. Spaeth, M.D.

Regular Meeting, March 17, 1938

The Use of Paredrine in Cycloplegia. I. S. Tassman, M.D.*

Vertical Prism Values as They Affect the Bifocal Prescription. Sidney L. Olsho, M.D.*

Pericorneal Vascular Obliteration for Various Types of Keratitis. Trygve Gundersen, M.D.*

SECTION ON OTOLARYNGOLOGY‡

Regular Meeting, January 19, 1938

Enlarged Prolapsed Ears, Anatomical Consideration and Surgical Correction. Warren B. Davis, M.D.

Primary Melanoma of the Nasal Cavity: Two Cases. Austin T. Smith, M.D.

† The proceedings of the Section on Ophthalmology are abstracted in the *American Journal of Ophthalmology* and the *Archives of Ophthalmology.*

* *By invitation.*

‡ The proceedings of the Section on Otolaryngology are abstracted in the *Archives of Otolaryngology.*

Early Attention to the Larynx in Tuberculous Patients. Robert M. Lukens, M.D.

Parenteral Administration of Certain Substances in Upper Respiratory Infections. George M. Coates, M.D., Warren B. Davis, M.D., and William Gordon, M.D.

Demonstration of Sectioned Skull to Show Relations to Nasal Accessory Sinuses. Addinell Hewson, M. D.

Regular Meeting, February 16, 1938

Symposium on Newer Drugs Used in Otolaryngology

The Otolaryngologist's Point of View. James A. Babbitt, M.D.

The Internist's Point of View. Wm. Egbert Robertson, M.D.*

Discussion of Experimental Use of Sulfanilamide in Streptococcus and Pneumococcus Meningitis. John A. Kolmer, M.D.*

The Pharmacologist's Point of View. Horatio C. Wood, M.D.*

Meeting, March 16, 1938†

Parapharyngeal Hemorrhages, Diagnosis and Treatment. Louis Hubert, M.D. and Francis W. White, M.D. Discussion by Warren B. Davis, M.D.

Treatment of Carcinoma of the Larynx. Rudolph Kramer, M.D. Discussion by Gabriel Tucker, M.D.

Modification of the Semilunar Ganglion Approach Used in Surgery of Petrous Pyramid. Marvin F. Jones, M.D. Discussion by Oscar V. Batson, M.D.

SECTION ON MEDICAL HISTORY

Regular Meeting, February 14, 1938

Sir Hans Sloane, Naturalist—Physician—Collector—Benefactor. Burton Chance, M.D.

* *By invitation.*

† Joint meeting, in New York, with the Section on Otolaryngology of the New York Academy of Medicine.

The Practice of Obstetrics in the United States in the 18th Century. Edwin M. Jameson, M.D.*

L'Hôpital Saint Louis: A Brief Biographical Sketch of Its Early Teachers and Their Influence upon American Dermatology. Paul E. Bechet, M.D.*

Regular Meeting, March 14, 1938

The Development of Cystoscopy. Hugh Hampton Young, M.D.*

Historical Summary of Bronchoscopy. Chevalier L. Jackson, M.D.

Regular Meeting, April 11, 1938

Two Contemporary Manuscripts Bearing on the Death of Charles II of England.† E. B. Krumbhaar, M.D.

Poets, Panegyrists and Poisoners from St. Bartholomew's Hospital. Walter Reginald Bett, M.R.C.S. (*Engl.*), L.R.C.P. (*Lond.*).*

Past and Present Concepts of Bacterial Endocarditis. Emanuel Libman, M.D.* and Charles K. Friedberg, M.D.*

* *By invitation.*

† Printed in this issue of the Transactions & Studies.

Memoir of Judson Daland, M.D.*

By Arthur C. Morgan, M.D.

Judson daland, m.d., was born in New York City on July 11, 1860, and was graduated from the Medical Department of the University of Pennsylvania in 1882. He died at Ventnor, N. J., August 14, 1937, from the remote effects of an automobile accident sustained in England two years previously.

Doctor Daland was elected to fellowship in the College of Physicians of Philadelphia at the November meeting of 1887. His sponsors were Doctors William Pepper, W. F. Norris, and William Osler—a galaxy of physicians who surely foresaw the brilliant career to which he was destined. He was a councillor of this College in 1918, 1919 and 1920. In the College library over thirty reprints of Doctor Daland's articles, as well as portraits of him, are on file. His last published scientific article appeared in *International Clinics*, 1936, Series 46, Volume 1. This paper, "Clinical Observations on Onchocerciasis," was the result of studies made by him in Guatemala in 1934, and had been read by him on November 26, 1934 at a meeting of our Section on General Medicine.

Doctor Daland's gifts to the Mütter Museum were as follows: (*a*) Catheter—an exact reproduction of one excavated in the ruins of Pompeii. Reproduction by Angelo of Naples. (*b*) An exact reproduction of a cup which was used in cupping in the time of Pompeii, and which was discovered in the ruins during one of the excavations. (*c*) Two photographs of ancient Roman surgical instruments on exhibit in an Italian museum. Presented January, 1935. (*d*) Wooden stethoscope obtained in Edinburgh in 1889. It was made from timber taken from the old Edinburgh Infirmary. (*e*) A shrunken human head from Ecuador. (*f*) Tsetse Flies (Mounted).

* Read February 2, 1938.

From his early days Doctor Daland manifested traits of character that soon made him an outstanding figure in medical research. He was aided in this by close personal association with William Pepper, Provost of the University of Pennsylvania, at the time when study of the blood and rapid advances in organic chemistry were in the making. He was an omnivorous reader and writer. He traveled extensively, almost over the entire civilized world, in his avid search for the causes of disease and in the study of ethnology and paleontology.

He was a student of no mean accomplishment. He was a friend to the medical student and the young doctor. His carriage seemed to show aloofness, but this was only for the purpose of testing the individual. Once satisfied that the person was a worthy student and searcher after truth, Doctor Daland warmed to him and proved to be a worthy counselor and adviser to those who learned to know him for his real worth.

He was associated with the medical department of the University of Pennsylvania from 1882 to 1892.

From 1903 to 1916 he was Professor of Clinical Medicine at the Medico-Chirurgical College of Philadelphia, advancing to Professor in Medicine when that worthy Institution became the Graduate School of Medicine of the University of Pennsylvania, retiring in 1921 to become Emeritus Professor.

He discovered evidence of surgical operations on skulls in Peru. He studied sleeping sickness in British Central Africa and wrote about the tsetse fly; cholera in Naples; plague and leprosy in India, and diseases of the Eskimo Indians in Alaska.

He escaped the earthquake in Japan in 1923, being away from Tokio at the time on an ethnologic hegira to study a race of Japanese pigmies.

He was the second president and one of the founders of the Philadelphia Institute for Medical Research, which was planned as a memorial to Pasteur at the centennial celebration of his birth in 1922. This Institute is housed in the Philadelphia General Hospital, in the building formerly known as the "brick building" of the tuberculosis department.

The bulk of his estate, amounting to over $300,000, was willed to the American Philosophical Society as an endowment to be known as the "Judson Daland Foundation for Research and Clinical Medicine." It was directed that the income from the Endowment Fund shall be given periodically to the Institute.

Doctor Daland's remains were cremated, his ashes to be placed in an urn, which will rest in the building of the American Philosophical Society and will bear this inscription—

"JUDSON DALAND
SEARCH FOR TRUTH"

Two Contemporary Manuscripts Bearing on the Death of Charles II of England*

By E. B. Krumbhaar, M. D.

Professor of Pathology, University of Pennsylvania School of Medicine, Philadelphia

In most histories, Charles' death is ascribed to apoplexy, a defensible term in the 17th century when it was loosely applied to any sudden convulsive or paralytic attack, but incorrect today when it signifies a cerebral attack caused by cerebral hemorrhage or thrombosis. The newer meaning, to be sure, began with J. J. Wepfer's important clinico-pathological study of 1658, but this contribution had obviously made little impression on King Charles' physicians, if it was known at all by them.

The recent acquisition of two contemporary documents[1] bearing on this subject has suggested a short review of the subject, even though it has already been treated at some length by modern writers—Raymond Crawfurd in "The Last Days of Charles II (Oxford, Clarendon Press, 1909) and James Rae in "The Death of the Kings of England (London, Sherratt & Hughes, 1913). It is not surprising that there is considerable contemporary evidence bearing on the King's fatal illness. Any sudden royal death that was not from obvious causes provoked suspicion of poison, or at least every effort had to be made to disprove this possibility. Furthermore, the politico-religious situation in England at the time made it practically certain that this point would be raised in this case. Crawfurd tells of eight eyewitnesses who left accounts of the fatal illness, and there are also rather full references in Evelyn's diary, the notes of Dr. James Welwood, physician to Queen Mary, and of Gilbert

* Read before the Section on Medical History, April 11, 1938.

[1] Presented by the author of the paper to the library of the College—[Editor's note].

Burnet. Burnet, who mentioned that after the autopsy the stomach and intestines were thrown out and some days later were seen lying in a gutter of the Palace courtyard, also allowed that many small vessels of the brain were burst. This contradiction of the official autopsy record shows how little he is to be relied upon for testimony on the case.

Very briefly, the facts of Charles' last illness were as follows: A notorious "hard liver," he had been in poor health for several years; in fact, in 1678, seven years before his death, he had convulsive attacks probably similar to those of his final illness. For several weeks before his last illness he had had a prolonged attack of gout, which had prevented his usual exercise, and he had a "humor" (abscess?) on his leg which had been allowed to heal over, got painful and swollen again, and was not healed at the time of his death. The morning of Monday, February 2nd, 1685,[2] the King felt badly and appeared pale and silent. While being shaved, he fell back with a cry, apparently lost consciousness and had a convulsion, though no accurate, reliable description of his "fit" is available. He was bled by one of his physicians, Dr. King, cupped, purged, blistered with cantharides (!), and given an emetic and an enema. He improved with further bleeding and numerous drugs; but, though he had no convulsions for 2 days, was so regularly worse at night that intermittent fever was feared and cinchona given. By Thursday, his condition was again desperate, more convulsions racked him, though he was conscious between attacks. By Friday morning he was extremely dyspneic, at ten he was unconscious and he died shortly before noon.

An autopsy was performed the next day, of which Sir Charles Scarburgh gives the following report (Crawfurd):

"1. In Cerebri Cortice Venae et Arteriae supra modum repletae.

2. Cerebri tum ventriculi omnes serosa quadam materia inundati, tum ipsa substantia consimili humore haud leviter imbuta.

[2] The year of Charles' death is now customarily given as 1685; in our manuscript, as in other contemporary documents, it is given as 1684. Not until the Calendar Act of 1750 was the beginning of the legal year in England shifted from the 25th of March to the first of January.

3. Thoraci dextri lateris Pulmones Pleurae tenaciter adhaerentes, Sinistra vero plane liberi, quemadmodum ex Naturae instituto in sanis esse solet.

4. Pulmonum substantia neutiquam culpanda quidem, sed Sanguine referta.

5. Cor amplum firmumque, et in omnibus rectissime formatum.

6. In infimo ventre nihil praeter naturale, nisi quod Hepatis color ad lividitatem inclinaret, forte a sanguinis inibi restitantis pleonasmo, quo Renes et Lien cernebantur suffarcinati."

It is obviously a translation of this same report that appears in the first of our manuscripts (See Fig. 1):

"In the body of his late sacred Ma:ty of happy and blessed Memory open'd by his Chyrurgeons this day being the 7th of February 1684 were observed these things following.

1. In the outward parts of ye Brain the Vessels fuller of Blood then ordinarily they are found.

2. The Ventricles of the Brain full of Water; & in the whole substance of it a greater quantity of the like serous liquor then is usuall.

3. In the Breast the Lungs on the right side every where adhering to the Ribbs; the other side free as naturally it ought to be.

4. The substance of the Lungs perfectly sound, but full of Blood.

5. The Heart large & very firme as it ought to be.

6. In the lower Belly nothing amisse, only the liver of a Colour darker then ordinary, & full of Blood, as were alsoe the Kidneys & Spleen.

Chas. Scarburgh. Tho: Witherley. Walt: Charleton. E: Dickinson. Pe: Barwick. Tho: Millington. Rob: Brady. Ferd: Mendez. Wal: Needham. Ed: Browne. Th: Short. Rd: Lower. Ch: Fraiser. Edm: King. Jos: LeFevre. Christianus Harel. Martin Lister. Ri: Pile. Jo: Pearse. Aimé. Tho: Hobbs."

Mr. H. R. Aldridge, Assistant Keeper of the Department of Manuscripts of the British Museum, assures me that this is a genuinely 17th century document. He suggests that it might be a translation, made to be sent to the Lords Lieutenant of the Counties, of an official Latin original, along with the news of the death, though there is nothing to support this view among the State Papers for the period. No other example of a contemporary English version is apparently known. Crawfurd suggests that Scarburgh's lengthy Latin account of the illness, a manuscript now in the library of the Society of Antiquaries, was probably written to refute the suspicion of poison, possibly at the request of King James, whose physician he also was; the autopsy report, which concludes the manuscript, must be assumed to be a transcription of the now lost official original. The "Councell" mentioned on the outside of our manuscript, for whom the report was made, was of course the Privy Council; but Mr. Aldridge informs me that there is no such report among the Privy Council documents in the Public Record Office; nor is there a copy "in the minute-book or Register of the Privy Council: there is, strange though it may sound, no reference to Charles' death as such." The Record Office officials have suggested that as the old palace of Whitehall was burned down in 1697, and all the "loose papers" (as distinct from the Registers) of the Council perished in the conflagration, the original certificate was probably burned at that time.

Our manuscript is a folded folio sheet, $7\frac{1}{2}''$ by $11\frac{3}{4}''$, with, in the center of one half, a watermark representing the royal arms; in the center of the other half, the initials R D T I, as a countermark. These I have not been able to identify. Twice folded, the manuscript is dust-soiled on the outside, comparatively clean within. The evidence that it was filed systematically with other documents is strengthened by the notation at the top of the outside, in the same hand: "The State of his late Majesty's Body when open'd February 7th, 1684, read to the Councell the same evening." The fact that the name of his late Majesty is not given would indicate that either the manuscript was written very shortly after the death of Charles or that it was filed with other documents bearing on that monarch.

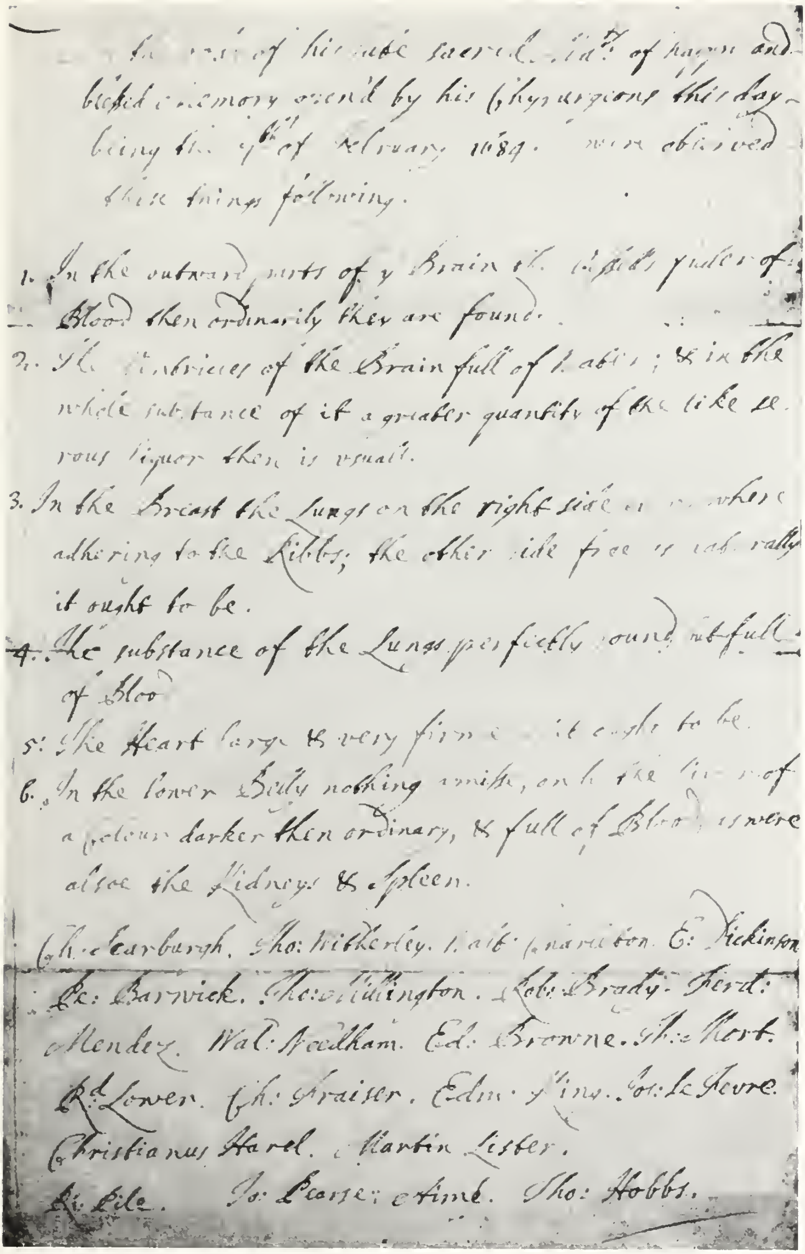
The distinguished group that signed the autopsy report requires at least a few words of comment—all but three (Pile, Pearse and Hobbs) can be found either in the "Dictionary of National Biography" or Munk's "Roll of the Royal College of Physicians." Heading the list is Sir Charles Scarburgh, who was the King's chief physician in his final illness, and subsequently wrote the lengthy Latin report that is treated in detail by Crawfurd. Friend of Pepys and Harvey, the latter of whom bequeathed him "my velvet gowne" and "all my little silver instruments of surgerie," his portrait can be found in the Hall of the Barbers' Company, showing him lecturing on a dissected body with the aid of Edward Arris. By far the most distinguished today in the list is Richard Lower, too well known for his contributions to cardiac physiology to require further comment here; by his contemporaries he "was esteemed the most noted physician in Westminster and London." Lower followed Willis in having the largest practice of his day in London. When he espoused the Whig cause this distinction passed to Short—another signer of our document—who was in turn followed by Radcliffe of Gold Headed Cane fame. Walter Charleton, like Millington, Browne and others of the group, a President of the Royal College of Physicians, had been appointed physician to Charles I at the early age of 22 and continued in his office at the Restoration. He wrote so extensively that his academic success was regarded as injurious to his practice. His "Spiritus Gorgonicus," printed by the Elzevirs, is illustrative of the passing scholasticism in attributing the formation of calculi to a special stone-forming spirit. Martin Lister claims our attention as a Yorkshire man like his namesake the immortal Joseph, and thus as a possible relative of the latter, while Edward Browne attracts us as the eldest son of Sir Thomas Browne, of "Religio Medici" fame. Sir Edmund King, created doctor of medicine by the Archbishop of Canterbury, and a favorite of the King on account of his interest in chemistry, is an important figure in our story, as the physician who happened to be present when the King had his "fitt." The improvement that followed prompt bleeding, done on Dr. King's own responsibility, brought him much praise and a financial award that was never paid. Thomas Short also occupies a special place in the narrative as the physician whom the author of our second manuscript refers to as having thought himself as well as the King poisoned for talking too freely about the nature of the King's death. Burnet says that Short died suddenly after taking a large draught of wormwood wine in the house of a Papish patient.

It will be noted that the signatures on the last line of the report are separated from the others by a space, and that they are also the only names not to be found either in the "Dictionary of National Biography" or in Munk's "Roll of the Royal College of Physicians." They are the only ones, furthermore, that did not appear in Scarburgh's manuscript as prescribers for the King or as consultants. It is suggested, therefore, that these were the "chyrurgeons" who "open'd" the body of his late Majesty.[3]

To return to the nature of the King's illness: though it is obviously difficult to interpret medical observations that are 250 years old, it is clear, both from symptoms and autopsy findings, that it was not due to cerebral hemorrhage.

Nor is there any ground for suspecting poison. That poisoning was suspected is shown not only by a report circulated that an effort was made to prevent the customary autopsy, but also by the care to note the condition of the abdominal viscera, and by the relatively private funeral given by his (parsimonious) successor, James II. Crawfurd gives a letter from the Dowager Lady Sunderland in which she states "I believe yet there is scarcely anybody beyond Temple Bar that believes his distemper proceeded from anything but poison." In similar vein, is a section of the second manuscript that illustrates this article. This manuscript is "A Short Character of Charles ye second King of England, setting forth his untimely Death" by John Sheffield, Earl of Mulgrave, Duke of Buckingham (1649–1720). It is written in a beautifully clear contemporary hand, though I have no means of judging whether or not it is in Sheffield's own hand. On the back in another contemporary handwriting are the words "My Ld Mulgraves character of K Charles ye 2d." Laudatory throughout, the statement leaves no doubt that the author was not the only one to think the King had been poisoned: "I am obleigd to observe, that I am sure yt ye most knowing & most deserving (Doct. T. Short) of all his Physitians did not only believe him poysoned, but thought himself so too, not long after for declaring his opinion a little too boldly." The last

[3] W. R. Le Fanu, Librarian of the Royal College of Surgeons, has kindly pointed out that Thomas Hobbs is probably not the L. R. C. P. named by Munk, but the Sergeant Surgeon to the King, who was a master of the Barber Surgeons' Company in 1687. The word 'Aimé" after Pearse's name is confusing. No such person can be identified, so perhaps it is merely faulty transcription for "Ainé," unlikely as this seems for English custom of the 17th century.



[illegible] the [illegible] of his late sacred Ma[illegible] of happy and blessed memory open'd by his Chyrurgeons this day being the 7th of February 1684. were observed these things following.

1. In the outward parts of ye Brain the vessels fuller of Blood then ordinarily they are found.
2. The Ventricles of the Brain full of Water; & in the whole substance of it a greater quantity of the like serous liquor then is usuall.
3. In the Breast the Lungs on the right side [illegible] where adhering to the Ribbs; the other side free as naturally it ought to be.
4. The substance of the Lungs perfectly sound but full of Blood.
5. The Heart large & very firm as it ought to be.
6. In the lower Belly nothing amiss, only the Liver of a colour darker then ordinary, & full of Blood as were alsoe the Kidneys & Spleen.

Ch: Scarburgh. Tho: Witherley. Walt: Charleton. E: Dickinson.
Pe: Barwick. Tho: Millington. Robt: Brady. Ferd: Mendez. Wal: Needham. Ed: Browne. Th: Short.
Rd Lower. Ch: Fraiser. Edm: King. Jo: le Fevre.
Christianus Harel. Martin Lister.
Ri: Pile. Jo: Pearse; etime. Tho: Hobbs.

FIG. 1

THE AUTOPSY REPORT ON CHARLES II OF ENGLAND

The only known contemporary version in English. Cf. Sir Charles Scarburgh's Latin version, and a modern translation of it, in Raymond Crawfurd's, "The Last Days of Charles II."

(Ms. in the library of the College of Physicians of Philadelphia.)

paragraph of the manuscript (here reproduced) not only shows by its attitude toward James II that its author did not suspect James, but also that the appreciation was [illegible] written immediately after King Charles' death. In Dr. James Welwood's Memoirs, poison is given place with apoplexy as the two possible causes; yet, as Crawfurd has pointed out, Welwood admits that King Charles himself did not suspect poison and that there was nothing found at autopsy to be attributed to poison.

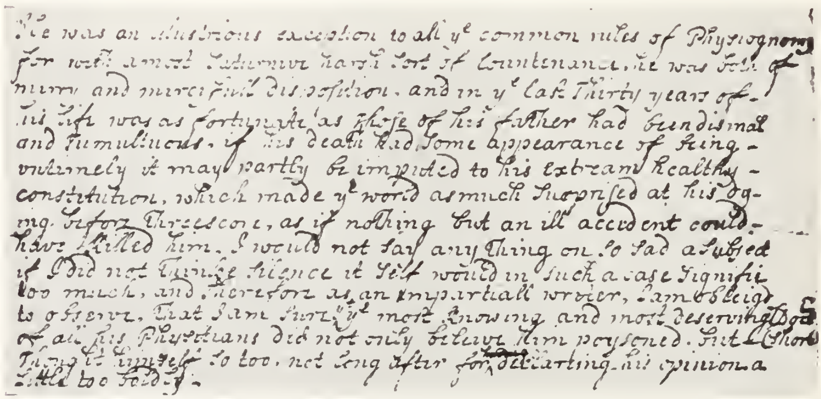

He was an illustrious exception to all ye common rules of Physiognomy for with a most Saturnine harsh sort of Countenance, he was both of merry and mercifull disposition. and in ye last Thirty years of his life was as fortunate as those of his father had been dismal and tumultuous. if his death had some appearance of being untimely it may partly be imputed to his extream healthy constitution, which made ye world as much surprised at his dying before threescore, as if nothing but an ill accident could have killed him. I would not say any thing on so sad a subject if I did not think silence it self would in such a case signifie too much, and therefore as an impartiall writer, I am obliged to observe, that I am sure ye most knowing and most deserving Doctor of all his Physicians did not only believe him poysoned. but Short thought himself so too. not long after for declaring his opinion a little too boldly.

Fig. 2

The Earl of Mulgrave's "Character" of Charles II of England

The passage shown is that in which one of the king's physicians, Dr. Thomas Short, is credited with the belief that Charles was poisoned and he himself, also, a little later, for declaring this opinion too boldly.

(Ms. in the library of the College of Physicians of Philadelphia.)

We, too, in view of the clinical history and autopsy findings, can dismiss poison, if we except the effect of the cantharides blisters on an already damaged kidney.

In modern terminology, the autopsy diagnosis would read: "Edema of the brain. Chronic fibrous pleurisy (right). Hypertrophy of the heart. Congestion of liver, spleen and kidneys." It requires but little imagination to picture an arteriolar nephrosclerosis, or a chronic glomerulonephritis, which without marked scarring might easily have been overlooked a century and a half before the days of Bright. The convulsions, then, would be uremic in nature, due to a gradually increasing renal insufficiency which appears to have been seve[illegible]ough seven years earlier to cause a sim[illegible]ck. The ec[illegible]matous brain and enlarged heart are quite [illegible]stent with this diagnosis, the pleural adhesions being attributable to an early tuberculosis and the visceral congestion to a terminal circulatory failure. Rae quotes from a "Life of Charles II" (Ed. 1706): "His body stunk so extremely within a few hours after his death notwithstanding the coldness of the season that the people about him were very much offended with the smell." One does not have to have performed many autopsies to have become familiar with the uremic stink. To account for sundry other observations, Burnet speaks of two or three blue spots on the outside of the stomach (which may be dismissed as probably agonal petechiae in the serosa) and a mortified blackness on the shoulder (probably the result of cupping). The "issue" on the leg must remain undiagnosed.

The view expressed here is in substantial agreement with Crawfurd's "gouty kidney with uremia." It is difficult to see how Sir Henry Halford, a distinguished physician contemporary with Bright, should have continued the error of the Stuart physicians by calling the King's disorder a fair specimen of apoplexy. The convulsions seven years before his death, which were not the only ones that he had recovered from, are harder to evaluate. Seven or more years is a long survival period after uremic convulsions. Dr. David Riesman has suggested that the earlier convulsions may have been due to "senile epilepsy," probably of the hypertensive variety. The slight facial asymmetry of the Westminster Abbey effigy not only is, as Crawfurd points out, not characteristic of apoplexy but it could be adequately explained as a mask maker's artefact, a likely occurrence after an autopsy in which the brain had been removed. King Charles, then, appears to have been killed by an exacerbation of his renal insufficiency, alleviated by bleeding, but aggravated by cantharides therapy, and his terminal "fitts" were uremic not apoplectic.

The Affair of the "1613" Printing of Johannes Rümelin's *Catoptron*

By W. B. McDaniel, 2d, Ph.D.

Librarian of the College of Physicians of Philadelphia

A recent announcement from this library[1] made known the discovery in the library of an example of the very rare 1613 printing of the Rümelin (Remmelinus) *Catoptron microcosmicum*, or "Microcosmic Mirror," a set of three large-folio-size anatomic plates employing the device of superimposed flaps perhaps first suggested by Vesalius in his *Epitome*. Such flaps, as is well known, constitute the chief distinguishing feature of the class of early anatomic representation called fugitive sheets, a picturesque term derived, presumably, from their broadside-character, which predicated but an evanescent life for them. Rümelin's *Catoptron* is celebrated as representing the ultimate elegance of this piquant, but rather impractical, school of popular Anatomy, and, through several editions, enjoyed wide favor for many years under somewhat peculiar circumstances. These circumstances arose more or less naturally from the ambiguous nature of the first printing of the *Catoptron*; were later supported by the great rarity of extant examples of the edition; culminated in the creation of a legend concerning its auspices. We now hope to show that this legend, which is perpetuated in several modern bibliographies of anatomic literature,[2] may safely be consigned to whatever corner

[1] The library's mimeographed *Fugitive Leaves* XXI (Dec., 1937). (The same volume in which the *Catoptron* was discovered, as was there reported, contained also a series of the Aselli *De lactibus* plates in various stages, progressing from ink sketches to the complete, colored woodcut prints; hand-painted copies of the illustrations to the *De formato foetu* of Fabricius ab Aquapendente; 2 unrecorded fugitive sheets. Further comments on these will appear in later issues of the Transactions & Studies.)

[2] The Choulant-Frank account of this edition, for instance, carrying on the legend, is almost entirely erroneous, neither the original author nor his translator, apparently, having seen an example of the 1613 printing. There is no example of the edition in the Army Medical Library or the library of the New York Academy of Medicine, and it is not improbable that the College of Physicians' is the only one in this country.

of limbo is reserved for legends which have lost their virtue, if not their mythopoeic charm.

The first edition of the *Catoptron* is commonly viewed as a plagiarism achieved by its publisher, one Stephan Michelspacher.[3] It is unnecessary to attempt to discover when or where this interpretation first entered the literature. A plausible, though perhaps unintentional, originator would be the English anatomist James Douglas, who published an excellent bibliography of the anatomical literature, one which was widely used by subsequent bibliographers.[4] In his description of Rümelin's chief work, Douglas, paraphrasing a passage in the author's preface to the second, 1619, edition, says that Rümelin "never contemplated publishing the work, but fashioned it only for his own use, in order to view many parts by means of a few and to call to mind a variety of facts through the aid of summaries; but it so happened that the general talk of it among his friends caused the work to be wrested away from him for inspection and circulation, until, through their persuasion and at their expense, it began to be published, without his knowledge, and to be enjoyed like an unripe fruit; but when he discovered that it abounded in defects, and teemed with numerous, intolerable errors made by the engraver and printer, he again, albeit unwillingly, took up the work which he had designed 14 years earlier, revised it, and thus offered it in another dress, in the hope that it might give pleasure."[5]

Whether Douglas's account be the basis of the later state-

[3] As an illustration of the current application of this view, we cite a bookdealer's catalogue received in the library on April 21, 1938. The catalogue offers for sale an example of the not exceedingly rare second, or 1619, edition, prefacing the description with the now familiar (and we hope to show, erroneous) statement, "first edition published [sic] by the author himself."

[4] Douglas, James: Bibliographiae anatomicae specimen . . . Ed. sec. Leyden, 1734. (The first edition, 1715, does not mention the 1613 *Catoptron.*)

[5] Douglas, 218: se de ejus publicatione nunquan cogitasse sed saltem confecisse, ut ipse solus multa paucis conclusa introspiceret, & brevibus in memoriam varia revocare; at contigisse, ut collati amicorum sermones illud & videndum & tradendum ita extorserint, quo dein suasu & impensis ipsorum, publica luce, nesciente se, frui, & ut praecox fructus gustari coeperit: cum vero defectibus abundare, & erroribus caelando & imprimendo commissis pluribus, minime ferendis, scatere deprehenderit, invitum se, quae ante 14 annos meditatus fuerat, resumsisse, revidisse, & ut alio plaudeant habitu, operam dedisse.

ments, or not, it represents a plausible origin for a misconception which has resulted in the virtual ostracism of the scarcely known 1613 edition as a badly executed plagiarism. On the publisher, Michelspacher, fell the onus of the unpleasant charge, and for reasons which will be apparent later.

It was not until 1931 that any evidence was brought forward tending to cast doubt on the authenticity of the legend. In that year, Karl Schadelbauer, in an article on Rümelin and Michelspacher,[6] brought to attention two other publications sponsored by Michelspacher, one of which the publisher dedicated to Rümelin. Dated at Augsburg, *5 May 1615*, this dedication, which we shall refer to as Michelspacher's apologia, presents the publisher's version of the circumstances attending the first publication of the *Catoptron*. From it we learn that Rümelin, though he had granted permission for the work to be published, had, with "sonderbare Modestia," refused permission for his name to appear in the work, despite the fact that his portrait and crest might well lead the reader to his identity; that, when the demands of others to know the name of the author finally induced Rümelin to permit his name to be used, the anatomical work and treatise was already in print; that Michelspacher, therefore, takes this opportunity to proclaim Rümelin's authorship.

This important communication from Schadelbauer is apparently the first, and so far as we know the only, one to suggest that the legend has all the time rested on an unstable foundation. Though Schadelbauer on the basis of this, Michelspacher's, version pronounces the 1613 edition to be a genuine one, a defendant's apologia, we venture to suggest, is weak evidence—unless it can be convincingly substantiated. As it happens, such substantiation is not far to seek; it may be found in the first two editions of the *Catoptron* itself.

Though the second, 1619, edition contained both plates and text in the one large-folio-size volume, such was not the case with the first edition. The first of the three plates of the original *Catoptron* bears, as may be seen (Fig. 1), the date *1613*. An

[6] *Arch. f. Gesch. d. Med.*, 1931, **24**, 123.

Elucidarius, or synopsis of the plates, in quarto, carries the date *1614*. The full text (from the manuscript of which the *Elucidarius* was excerpted), called *Pinax microcosmographicus*, likewise in quarto, is dated *1615*. Symbols identifying the author include, on the first plate, his portrait, with a statement of his age, his initials, and his crest; in the *Elucidarius*, an anagram symbolizing his name. The only name of those concerned with the tripartite publication to appear in full is that of Stephan Michelspacher. Though he is nowhere credited as author, the size of type used for his name and the position of the name on the title-pages of the parts in quarto would, in each case, practically guarantee his being accepted as the author by the unsuspecting reader or librarian.[7]

It is in the last part of this tripartite edition, that is, in the *Pinax*, that we come upon apparently hitherto uncritically observed evidence which, while substantiating Michelspacher's apologia, at the same time leads us to question the correctness of the position which Rümelin later seems to assume. This *coup mortel* to the legend is, in fact, reserved for Rümelin himself to deliver. For the *Pinax* contains a prolegomenon by the anonymous author himself, addressed to the candid and Apollonian lovers of the arts and philosophy. In it occurs the following highly significant passage:

"Although I fashioned this merely for my own use, in order to view many parts by means of a few and to call to mind a variety of facts through the aid of summaries—and for my own pleasure, with no thought of publication—nevertheless, I yielded to the persuasions of others and turned it over to them. *As a result, we now see it printed at their expense.*"—[my italics][8].

[7] Our own examples of the *Pinax* and *Elucidarius* (bound together) were catalogued under the name *Spacher*, with no indication that they referred to Rümelin's *Catoptron*. Pfeilsticker (see note 13 below) reported them as catalogued under Michelspacher's name in the University Library at Munich. The title-page of the English translation edited by Clopton Havers, London, 1702, gives the authors as "Michael Spaher of Tyrol, and Remilinus"! It is evident, from these few illustrations, that the authorship of Rümelin's work was, and probably still is, attributed generally to its publisher, Michelspacher.

[8] f.3a: Verum etsi quo Ipsi-solj multa paucis conclusa introspiceremus, & brevibus in memoriam varia revocaremus, eoque (nunquam enim de huius publicatione cogitabamus) delectaremur, olim construxissemus: tamen cum nobis persuaderj passi fuerimus, ut Alijs tradidissemus, Idipsum Eorum sumptibus lucem nunc aspicere videmus.

FIG. 1

The dated first plate of the three constituting the original edition of Johannes Rümelin's *Catoptron microcosmicum.* Symbols identifying the author are: his portrait; the statement of his age; his initials, with the epithet *Inventor;* his crest.

(Reproduced from the example in the library of the College of Physicians of Philadelphia.)

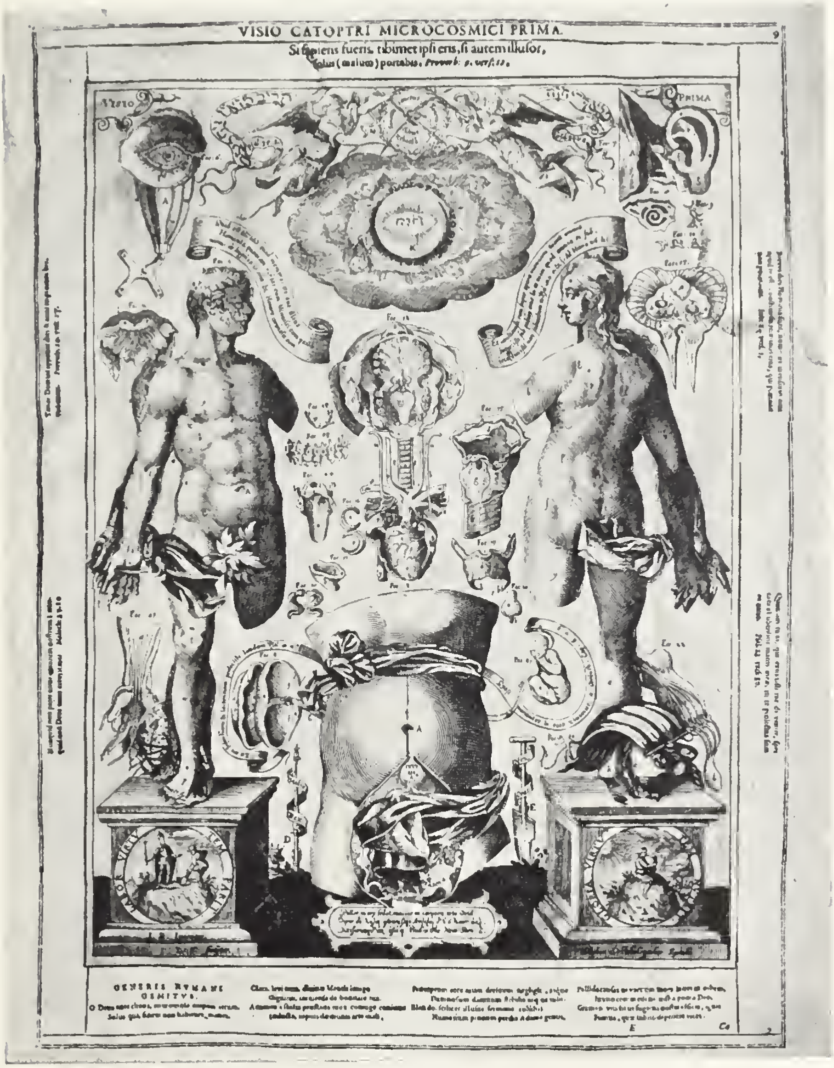


FIG. 2

The first plate of the 1619 edition of Johannes Rümelin's *Catoptron microcosmicum*, showing the surface revisions made by the author.

(Reproduced by courtesy of the library of the New York Academy of Medicine.)

In addition to the prolegomenon, we find an epilogue likewise addressed to the reader by the author, who, reiterating that he fashioned the work for his own use alone, adds:

> "nevertheless, I shall not now hinder many others from examining legitimately, in this *Catoptron*, the great ingenuity of the Creator."[9]

Towards the close of the epilogue, furthermore, Rümelin refers (f. [35b]) to the figure of death on the title-page of the *Pinax*.

With Michelspacher's apologia and these remarkably specific statements in mind, it is of interest to turn now, not to Douglas's report of Rümelin's statement in the 1619 edition, but to the words themselves.[10] Comparing Douglas's report, as given above, with Rümelin's own statement, which follows, we observe that the Douglas paraphrase not only unites non-consecutive statements, but omits the very ones which may be used as evidence on Michelspacher's behalf. For this reason, although it involves some repetition, we put forward the pertinent part of Rümelin's statement as it stands in the text, italicizing the parts of it omitted by Douglas:

> "I never contemplated publication of the work, but fashioned it only for my own use, in order to view many parts by means of a few and to call to mind a variety of facts through the aid of summaries, and for my own pleasure; but it happened that the general talk of it among my friends caused this Catoptron to be wrested away from me for inspection and circulation, until, through their persuasion and at their expense, it began to be published, without my knowledge, and to be enjoyed like an unripe fruit. *But recognizing my Catoptron presently*, I discovered that it not only abounded in defects *already known to me*, *ones connected with greater facility in producing and understanding the work* (*as lesser defects*, *these could be borne*), but teemed with many intolerable errors committed in the engraving and printing of the work, *through emendations*, *additions*, *and execution. Wherefore, I attempted*, *in so far as I was able*, *to suppress the work;*

[9] f.34b: nunc tamen non impediam, quin plurimi in eo Catoptro legitimè speculentur . . . tantum . . . Creator exhibuerit Artificium . . .

[10] I am indebted to the libraries of the New York Academy of Medicine and the Academy of the New Church, Bryn Athyn, Pa., for their courtesy in allowing me to consult their examples of the 1619 edition. (The edition of 1639 and the English translation of 1702 are available in our own library.) The Bryn Athyn example is of special interest in that its inclusion in the library of the great scientist Swedenborg, who devoted one period of his life to anatomical studies of now-recognized importance, attests the widespread use of Rümelin's work.

but the unceasing demands of those to whom the Catoptron had become known prevailed over these attempts, so that, despite my wishes (for what was done could not be undone), it was openly circulated, imopportunely and unfittingly. All the examples having been sold in the brief time since then, he who at that time assumed the expense has decided to make the same outlay again and has persuaded me, though with some difficulty, to furnish a revision. *Therefore, Illustrious Reader, you will receive a late fruit, the watering of whose shrub I have approached unwillingly; but, in order that my refusal might not allow the light of day to reveal the earlier mistakes,* the work which I designed 14 years ago I have taken up again, revised, and offer in another dress, in the hope that it may give pleasure."[11]

It is obvious from the above that Rümelin did actually make the assertion that the *Catoptron* was first printed without his knowledge. Now, confronted by the seemingly contradictory evidence of the author's prolegomenon and epilogue to the first edition, this curious later statement requires explanation. It can be interpreted either as a pure fabrication, perhaps designed to absolve the author from responsibility for the errors of which he was so conscious; or, as implying that the work was published after the author had reason to suppose that the projected publication, for which he had written a foreword and epilogue and of which he had seen even the design for the title-page, had been abandoned.[12] The rest of Rümelin's statement, as quoted above,

[11] Verso of title-page: . . . de ejus publicatione nunquam cogitabam, sed saltem ut ego solus multa paucis conclusa introspicerem, & brevibus in memoriam varia revocarem, eoque me ipsum delectarer; at contigit, ut collati amicorum sermones Catoptrum hoc & videndum & tradendum ita extorserint, quò deîn suasu et impensis ipsorum, publica luce, nesciente me, frui, & ut precox fructus gustari coeperit. *Verum meum Catoptrum recognoscens postmodum,* non modò defectibus *mihi prius notis, & saltem majorem Operis in conficiendo & assequendo facilitatem concernentibus, qui ac leviores tulerentur,* abundare, sed & erroribus caelando & imprimendo commissis pluribus, *correctione additione & expunctione opus habentibus,* minimè ferendis, scatere deprehendi. *Unde quantum in me totum tùm temporis opus supprimere conatus fui, at conatibus istis plurimorum indesinens Catoptri quibus innotuit prius desiderium praevaluit, ut citrà voluntatem (factum enim infectum fieri nequibat) in vulgus exiret, debito & conveniente neglecto sic tempore. Quia verò exiguo intercedente intervallo distractis exemplaribus omnibus, quis tùm sumptus faciens, de novo eos impendere constituit,* mihique limam addere, at difficulter persuasit. *Igitur serotinum, Candidè Lector, accipies nunc fructum, ad cujus plantam irrigandam invitus accessi, at ne recusatione pristinis mendis lux pateat,* quae antè 14 annos meditatus eram, resumpsi, revidi, & ut alio plaudeant habitu operam dedi.

[12] That the prolegomenon and epilogue were written by Rümelin himself is evident from the fact that the texts appear in the 1619 edition essentially unchanged, except for the altered and amplified statement considered here.

and Michelspacher's apologia, indicate that the assertion of publication without Rümelin's knowledge probably had some relation to fact. We assume, therefore, that the publication was accomplished after the author supposed it abandoned. Did Rümelin's belief that the project had been given up arise from his own withdrawal of permission to publish, or from other circumstances?

If Rümelin had himself withdrawn permission for the publication, it is, in the first place, odd that his material should have remained in the hands of the publisher. The weakness of his expression, "without my knowledge," and his failure to explain, or even to allude to, the contradictory evidence contained in his foreword and epilogue to the first edition suggest that he did not actually withdraw his permission. Though Michelspacher's evidence, as has been suggested, need not be taken as conclusive, his reiterated reference to Rümelin's permission to publish the work, and his failure even to hint that there had been any withdrawal of permission before the work was printed, may not be entirely ignored.

What circumstances, then, could have led Rümelin to suppose the publication abandoned and caused him later to speak of the publication as having been effected without his knowledge?

Though Michelspacher published at both Ulm and Augsburg,[13] it may be surmised that his major works were printed, and that he resided, in the latter city. Rümelin, living at Ulm in these years, was frequently embroiled with the town Council over his insistence on compounding his own prescriptions. Michelspacher tells us in his apologia that the printing had long been delayed by numerous hindrances. A plausible interpretation of Rümelin's assertion would seem to be that, because of the long delay and a probable lack of communication between the author and the publisher, Rümelin had thought the publication abandoned (as perhaps at one time it had been), only later to find, to his surprise, that the work was out and already on sale. Though

[13] Schadelbauer, 124–5. Also, Walther Pfeilsticker, in *Arch. f. Gesch. d. Med.*, 1929, **22**, 174; 382. Pfeilsticker, in his two papers, presents much new and interesting data on the life and work of Rümelin, but does not question the traditional view of the *Catoptron's* first printing.

the work may actually have *appeared* without Rümelin's knowledge, his acquiescence to its projected publication, at least, is clearly on the record; and no evidence has so far been offered to show that the acquiescence was repudiated until it was too late.

A hitherto perplexing point connected with the *Catoptron's* second edition, which Rümelin is supposed to have brought out on his own in resentment over the Michelspacher "plagiarism," seems to be elucidated by Rümelin himself in the above statement. In general, the author's revision of his work for the new, 1619, edition appears scarcely comprehensive enough to justify the ill-natured tone adopted toward the earlier edition. The texts of the two editions entirely correspond, except for the differences noted here. Rümelin's attention was chiefly directed, therefore, to effecting changes in the plates. A comparison of the plates of the two editions (Figs. 1 & 2) shows that a few additions, substitutions, or alterations were made in connection with the smaller anatomic figures; and shows, also, rather more elaborate decorative detail in the revised plates. The Rümelin portrait and crest disappear from the first plate altogether, the former to re-appear (a different, and more distinguished one, however), considerably enlarged, on the verso of the title-page. Why, with all this revision taking place, and in view of the state of war supposedly existing between the author and the publisher, was not the *Stephan Michelspacher*, *Excudit* obliterated in the revised plate?—certainly, an odd oversight to have to accredit to an irate author![14] The answer, it now seems, is a quite obvious one: the publisher of this second edition, as well as of the first, was Stephan Michelspacher. A conjecture to this effect is supported by the fact that Michelspacher's name was not removed from the plate; by the fact that the title-page does not give the name of another patron or publisher; by Rümelin's otherwise strangely indefinite expression, "he who at that time assumed the expense"; by the fact that in the same year, 1619, and from the same press (that of David Franck),

[14] It may be observed that Michelspacher's name continued to appear on the first plate in such later editions as employed the 1619 plates, although Michelspacher was not their publisher. In these instances, however, it is clear that the plates were merely reprinted without change.

Michelspacher brought out another work by Rümelin. But beyond mere conjecture, it is proved by the fact that the title-page of the original *Pinax* tells us that the work was published "at Stephan Michelspacher's great expense"—*impensis maximis Stephani Michelspacheri Tirolensis*; and by a statement of similar purport made by Michelspacher in his dedication of the work. Whatever the dispute between author and publisher was, it was not so irremediable as to prevent their achieving in association a second edition of the *Catoptron.*

It should be noted, finally, that, whereas from Michelspacher's apologia the impression is gained that Rümelin may have protested the dubious use which Michelspacher made of the author's desire for anonymity, Rümelin himself makes no reference to this, but describes his protest as being based on the intolerable errors committed in the engraving and printing of the work. We do not know whether these are two versions of the reason for one protest, or whether they, respectively, imply and proclaim protests based on two counts. Rümelin's whole statement in the 1619 edition has now, however, been shown to be so lacking in candor that we do not feel it improper, in view of all the other evidence, to attribute his indisposition less to the imperfections in the printing than to his resentment over Michelspacher's enterprise in bringing himself forward.

By way of drawing the threads together into the new pattern, we suggest that the pertinent circumstances attending the first and second printing of the *Catoptron* were approximately as follows:

The *Catoptron* of the Ulm physician Rümelin came into the hands of the publisher Michelspacher, who, though he published at both Ulm and Augsburg, probably published his major works, and resided, in the latter city.[15] Michelspacher, encouraged by

[15] Choulant-Frank suggest Ulm as the place of publication of the 1613 *Catoptron*, presumably because that was the city in which Rümelin was then living. Pfeilsticker, 180, conjectures that the place of publication was probably Augsburg, because of the fact that in 1619 Michelspacher published another work by Rümelin in that city (P., of course, was unaware that the 1619, Augsburg, edition of the *Catoptron* was also published by M.). Better ground for this conjecture, in our opinion, would be the facts that Michelspacher's dedication of the *Pinax* is dated at Augsburg and the engraver of the plates, Lucas Kilian, dwelt there.

the enthusiasm of the friends and patrons to whom he showed it, decided to publish the work and so communicated his desire to the author. Rümelin, though conscious of the work's defects, nevertheless yielded to the persuasions of his friends and the publisher, and even contributed the customary auctorial foreword and epilogue; but, uncertain of the impression which the work might make, insisted on its being published at least quasi-anonymously. Circumstances unknown to us, perhaps financial difficulties, either led to a temporary abandonment of the project or convinced the author that such had taken place. The printing was then either resumed or carried on without the knowledge of the author. When, eventually, the work appeared, supposedly to the surprise of the author, and a copy came into his hands, he discovered not only the defects known to him, but additional ones committed in the course of the engraving and printing; he discovered, also, that credit for the remarkable work was going not to the author, but to the less reticent publisher. Too late, he made futile attempts to suppress the edition.[16] Michelspacher, probably made uneasy by the effect which the author's quasi-anonymity in conjunction with his own undue prominence was having in important quarters, as well as by the author's outspoken protests, attempted to justify himself and make his peace by means of the dedicatory letter to Rümelin—and with satisfactory results.

[16] Considering the apparent tripartite publication, one may well be curious as to the point at which Rümelin's protest was registered His indication that it was after the work "began to be published" would seem to apply to the appearance of the *Catoptron* proper. Some little time may be assumed to have elapsed before examples of the *Catoptron* migrated even the comparatively short distance from Augsburg to Ulm. By the time Rümelin's protest reached Augsburg the printing of the *Elucidarius* and *Pinax* was completed. Though the last two are dated in successive years, *1614* and *1615*, it is likely that the second one followed closely after the first. Michelspacher's apologia is dated *5 May 1615*, and implies that the Rümelin work had just recently been published. Pfeilsticker, 389, observed that the Munich example of the *Pinax* (though dated later) was followed by the *Elucidarius* in the same cover. Our examples of the two are likewise bound together, in contemporary vellum, and in the same order. Dr. W. W. Francis kindly informs me that the examples in the Osler Library are similarly bound. An obvious conclusion would be that this is the form in which they were issued. It is, therefore, likely that the *Catoptron*, though the date *1613* appears on the first plate, was not actually published until shortly before the *Pinax* and *Elucidarius* appeared at the beginning of *1615*.

A few years later, the first, apparently not large, edition being exhausted, the publisher, who was at about the same time bringing out another work by Rümelin, approached the author with an offer to issue a revised edition of the *Catoptron*. Rümelin, although still somewhat resentful over the management of the earlier edition, nevertheless agreed, but on the understanding that, in the new edition, the author would assume his rightful place and the publisher a wholly subordinate one.

We can hardly maintain that Michelspacher's rôle was precisely that of a hero;[17] but the attempt to depict him as the villain of the piece seems now to be even farther removed from the truth. Rümelin's position, on the other hand, falls equally short of that of an outraged victim of piracy. His obvious acquiescence, in the beginning at least, to Michelspacher's project, his lack of candor in not explaining, or even referring to, this acquiescence, his later relations with the publisher, all unite in refuting the charge of plagiarism. Rümelin was a difficult customer, without doubt, (as, evidently, Michelspacher was, too) but at long last it is he who, albeit unwittingly, convinces us that there remains no longer any legitimate reason for withholding from the "1613" edition of the *Catoptron* the rites and honors customarily reserved for an interesting, little known, and genuine "first."

[17] His weakness is further exemplified by reference to another of his publications. His apologetic dedication to Rümelin is dated *5 May 1615*. Yet, on September 1 of the same year he issued another book, in the dedication of which he refers to works already in print "under my name"—among them, the *Catoptron* and *Pinax*, their author's name being conspicuous by its absence! Schadelbauer, 124.

Presentations of Gifts to the College

I

Portrait-Medallion of Henry H. Donaldson*

Director of Scientific Research, the Wistar Institute of Anatomy and Biology, 1906–38

By R. Tait McKenzie, M.D.†

In the spring of 1937, the Lenape Club celebrated the 80th birthday of its president, Dr. Henry H. Donaldson, and as part of the proceedings this portrait-medallion of him was presented.

Ever since 1906, when he came to Philadelphia from Chicago, two years after my own arrival, I had been attracted by his distinguished and sensitive profile and the shock of wavy hair that crowned it like a nimbus, and had even suggested sittings. A community of interests brought us much together. He was interested in the effects of exercise on the muscular system, and on the weight of organs in the rats he worked in his squirrel cages, and we had many consultations and discussions on these and kindred questions. The results of his long series of patient experiments have raised the level of the great reservoir of knowledge on this important physiological question.

An added link was forged in our friendship when we found ourselves and our brides guests at the table of Weir Mitchell, John Cadwalader, Wharton Sinkler, and other of the old Philadelphians who gave character and meaning to Philadelphia hospitality during a great era that is forever gone.

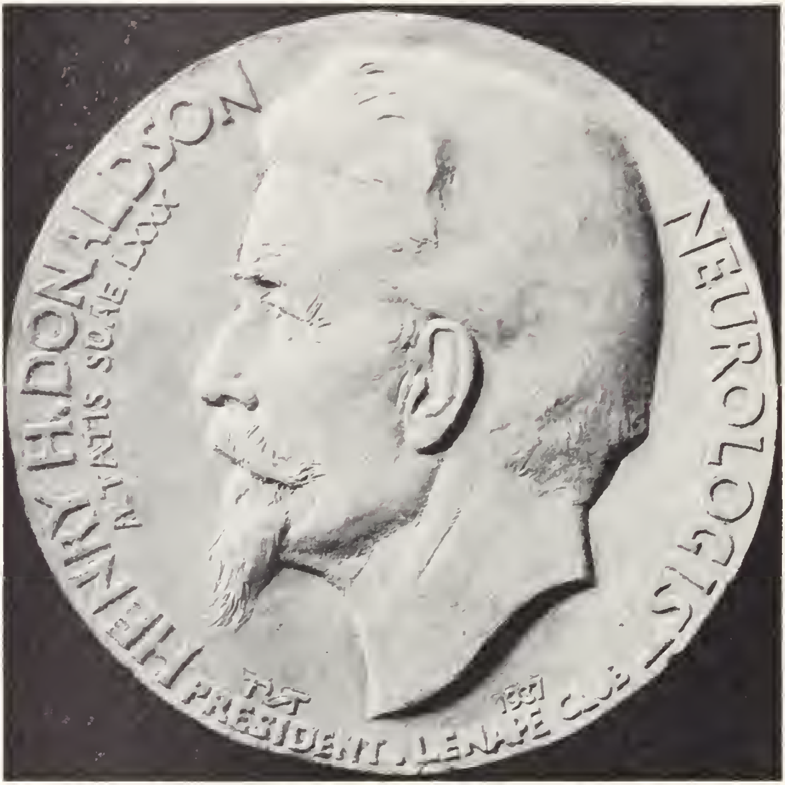
He was born May 12, 1857, in Yonkers, N. Y., took his A.B. at Yale in 1879, and attended the Sheffield Scientific School. The tradition still persists at that athletic college of Donaldson as a skilled boxer and swimmer. In 1885, he received a Doctorate

* Presented February 2, 1938.

† Died April 28, 1938.

in Philosophy from Johns Hopkins. He was instructor in Biology while still a student, then Associate Professor of Psychology, in 1887. In 1889 he went to Clark University as Assistant Professor of Neurology under that great educator, G. Stanley Hall.

From 1892 until 1906, he was Professor and head of the Depart-



Henry H. Donaldson

1857–1938

Director of Scientific Research, The Wistar Institute of Anatomy and Biology.
Modeled (1937) by R. Tait McKenzie, 1867–1938.

ment of Neurology in the University of Chicago, and was also, for part of this time, Dean of the University's Ogden Graduate School of Science. It was while there that a tuberculosis of the hip crippled him physically, but he never allowed it to affect his mental attitude or other activities.

His scientific associations were naturally with the American Neurological, American Psychological, American Physiological, American Philosophical Societies, the Association of American Anatomists, and the Academy of Natural Sciences. In most of these he held office as President, and was Vice-President of the American Philosophical Society at the time of his death. Yale University recognized his work by conferring on him the honorary degree of Doctor of Science, in 1906.

Such was the man whom the Lenape Club proposed to honor; and the hours spent in his office as he sat at his desk while I worked and he talked are to me a fragrant memory.

There were nine copies cast of the medallion. The first, for his wife; the second, for his good friend, Dr. W. H. F. Addison; the third, for the Lenape Club, the fourth, for the American Philosophical Society; the fifth, for the comprehensive collection of medical medals owned by Dr. Henry Barton Jacobs and housed in The Johns Hopkins University; the sixth, for the almost complete collection of medical medals gathered together by the late Dr. Horatio R. Storer and now in the Boston Medical Library; the seventh, I have retained in my own possession; the eighth went to another personal friend.

In December, I suggested to Mr. McDaniel the propriety of presenting one to the College, and the notice was sent out. In the short interval between the printing of it and the meeting tonight, all of him that could die has gone, and only his great work and his gentle spirit remain.

Mr. President: I trust that you will accept this ninth replica of the medallion-portrait of Dr. Henry H. Donaldson, and add it to our collection of medals commemorative of those who have contributed to scientific knowledge.

II

Two Additions to Our Harveiana

A Gift of Dr. Logan Clendening, Presented on Behalf of the Donor

By E. B. Krumbhaar, M.D.

I have been asked, Mr. President, to present to you for our library, as the gift of Dr. Logan Clendening of Kansas City, these two valuable books containing works by William Harvey. But, first, I would like to refer briefly to the College's collection of Harveiana, as I fear there is some truth in the criticism that we often do not know about the treasures that our College possesses. This splendid Harvey collection owes its chief impetus to the gifts of Dr. Samuel Lewis, whose remarkable library is, in part, housed in our Lewis Room, and, as is so often the case in College affairs, to Dr. S. Weir Mitchell. Comparison, by means of the Keynes bibliography, with the Harvey possessions of the other great libraries of the world shows that we appear to have the most complete collection known. We now lack only five of the entries in the Keynes bibliography (Nos. 2, 12, 18, 33, and 50), and most of these are probably unobtainable, only one or two copies of each being known to exist. The College's copy of the 1697, Bologna edition of the *De motu cordis* is said by Keynes to be the only copy he could trace, though it now appears that the Library of Congress may have a copy of this edition. Our copy of the *Opera omnia* printed in London in 1766 is of especial interest as a presentation copy, with an autographed letter, from the Bishop of Worcester to John Morgan, in 1767.

In addition to the books, we have a priceless manuscript—very few of Harvey's manuscripts have been preserved—giving medical advice and directions for treatment to his nephew and patient, Heneage Finch, later Earl of Nottingham and Lord Chancellor. Our teacup and saucer, with the Harvey coat-of-arms, authentic possessions of the great physician, are well known to many of you; I am glad to confess myself one of those who get stimulus from contact with an object so closely associated with this great man. The other items of our Harveiana, too numerous to mention in full, include a notable iconography; rubbings from the sarcophagus and monument at Hampstead; a colored copy of the Harvey "Stemma" of the University of Padua; and I should not fail to mention either the Harvey bibliography compiled by our former librarian, Mr. C. P. Fisher, in 1912, (which was called by Keynes "the only important source of bibliographical information hitherto available"), or the College's facsimile edition of the *De motu cordis*, published in 1928, on the tercentenary of its original publication. Truly these are all possessions to be proud of.

Perhaps I may tell you the circumstances that led up to Dr. Clendening's gift. It seems that Dr. Clendening and our librarian, Mr. McDaniel, were conversing recently about our Harveiana in the light of Keynes' bibliography. While Mr. McDaniel was out of the room getting our first edition of the *De motu cordis* (which, to their common satisfaction, proved to be the rarer variety on thick paper) our donor apparently took the opportunity to jot down, from the librarian's memorandum slip in the Keynes book, the list of seven items missing in our collection. You can imagine the joy of the librarian and those interested in the library when these two volumes arrived, with a letter from Dr. Clendening saying that he had noticed our wants and was glad to give these to fill two of them!

Little need be said about the donor. He is the author not only of scientific medical works (his "Methods of Treatment" has run through many editions), but also of popular medical books, such as "The Human Body" and "Behind the Doctor," which do not share in the errors so commonly found in such productions. He is also a noted book-collector and book-lover, and it is not difficult to imagine how hard it must have been to separate himself voluntarily from these two cherished possessions. They are both rare, though not so rare as those we still lack. This handsomely bound little volume is the 1649, Rotterdam edition of the *De circulatione sanguinis* (Keynes, no. 32); this larger volume, the *De ortu et natura sanguinis* of John Betts (Keynes, no. 49), contains Harvey's account of the autopsy on that very old man, Thomas Parr, who was said to have lived 153 years and who died some forty years before this book was published in London in 1669.

I have the honor, Mr. President, to present these valuable additions to the College library in the name of Dr. Logan Clendening, and, as a Fellow of the College, I would like to add my own appreciation of his very generous gift.

Recent Clinical and Experimental Observations in Adrenal Insufficiency*

By Russell M. Wilder, M.D., Ph.D.

Department of Medicine, The Mayo Foundation, Rochester, Minnesota

In the preparation of this lecture I have been guided by the assumption that what you would want to hear from me, on the subject before us, would be a report of the studies of my associates. I have no doubt that many in this audience are as familiar as I can be with the advances made in centers other than Rochester, including especially Philadelphia, where interest in the adrenal glands for a dozen years or more has been so continuous. If, then, I lay what might be regarded as undue emphasis on work done in the laboratories of The Mayo Foundation, and in the hospitals associated with The Mayo Clinic, it must be understood that I do so because I supposed that this was your desire.

Progress in medicine becomes continuously more dependent on the efforts of workers in the fundamental sciences. The biochemists perhaps are more fortunate than others. The major discoveries of the future probably will be theirs; but the task of adapting clinically what is learned in the laboratory, and that of calling the attention of laboratory colleagues to the new problems arising in the wards, can be met only by physicians. For this reason it is indispensable to have the closest possible association of physician and scientist—not only physical nearness, but mutual understanding as well. We have been fortunate in this respect, and nowhere is the importance of such coöperation illustrated better than in the field of diseases of the adrenals. In the bibliographies of scientific and clinical papers which deal with Addison's

* Mary Scott Newbold Lecture XLI, College of Physicians of Philadelphia, May 5, 1938.

disease, the names of chemists, physiologists, anatomists, pharmacologists and physicians have been jumbled together inextricably, since Thomas Addison's clinical pioneering prompted Brown-Séquard to resect adrenal glands from animals.

IMPROVED EFFECTIVENESS OF TREATMENT IN ADDISON'S DISEASE

In 1929, Snell and Rowntree (1) reviewed the experience of The Mayo Clinic with Addison's disease. There were records then of 103 cases in which the diagnosis was established reliably. The paper closed on a note of pessimism. Experience with all kinds of treatment had been distinctly unfavorable; life could be maintained only if some fragment of cortical tissue remained; a complication of any kind carried with it extreme danger, and the risk of any surgical intervention was so great that to attempt the operative treatment of a complication was prohibitive.

A year and a few months later Rowntree and Greene, writing jointly with Swingle and Pfiffner (2), were able to describe the successful treatment of acute adrenal insufficiency, the so-called crisis of Addison's disease, with cortin provided by Swingle from his laboratories in Princeton University.

Kendall's work with adrenocortical extraction, of which I later shall have more to say, began in September, 1930, and in 1933 Greene, Walters and Rowntree (3) reported on a major operation performed successfully in a case of Addison's disease, the patient being supported with extract before and after operation. They wrote that they had been unable to find in the literature any record of a previous successful major operation in a case of unquestioned Addison's disease, and so far as I know now, theirs was the first patient to survive such an operation.

This early experience with extracts of adrenal cortex, which were first supplied by Swingle and Pfiffner and later from The Mayo Foundation laboratories by Kendall, aroused the hope that a method of substitution therapy had been found which would be as effective in Addison's disease as insulin had become in diabetes. But, as so frequently happens in medical history, a period of discouragement was to follow. The extract unquestionably was of immense value for the treatment of the addisonian emergency, but serious handicaps to effective treatment of the chronic stages of Addison's disease were presented by the bulkiness of the injections required, their painfulness, the occasional occurrence of abscesses at the site of injection, and above all, by the costliness of the material. Only millionaires could afford such treatment, and in consequence, although the management of patients in the hospital was improved, their survival after dismissal remained unsatisfactory.

In a paper by Snell (4), prepared in 1933 although published later, the pessimism which we all felt is recorded. On the basis of his data, the best that could be said was that a group of sixteen out of forty-six patients were still alive at the end of three years of experience with cortical extract, only seven of these having lived more than one year after treatment with extract.

It was at this time of ebbing confidence that Robert Loeb's (5) major contribution was received. Marine and Baumann (6) and Rogoff and Stewart (7) had observed extension of survivals after adrenalectomy as a result of injecting sodium chloride, and some clinicians previously had commented on the benefit to be derived from intravenous injection of solutions of salt. In the paper of Rowntree, Greene, Swingle and Pfiffner, to which I referred before, the statement appeared that "mention should be made of the tremendous value of a solution of glucose, 10 per cent, and sodium chloride, 1 per cent, administered intravenously in the crisis and terminal stages of the disease." However, Loeb was the first to describe clearly the changes in balances of electrolytes in adrenocortical insufficiency, and to recognize the value in chronic treatment of continuous administration of extra sodium chloride. The major disturbance of the mineral metabolism, as he showed with patients in severe adrenal insufficiency, is in the balance for sodium and chloride. An increased excretion of these ions occurs in the urine and a decreased concentration of them in the blood. The loss of sodium ion usually exceeds that of chloride. A decrease in the *volume* of the blood is associated with proportionate increases for the concentrations of the plasma protein, oxygen capacity, sulfate and phosphate; whereas both the nonprotein nitrogen of the plasma and the potassium increase disproportionately. These various alterations can be reversed by administration of adrenal cortical hormone. Loeb's observations were confirmed by Harrop and his associates (8, 9), and in our laboratories by Allers (10), who added the important information that the survivals of adrenalectomized dogs, receiving sodium chloride, could be extended indefinitely without resort to hormone, if the acidosis consequent to loss of more base than acid was prevented by administering sodium bicarbonate or sodium citrate.

The clinical significance of this knowledge was apparent. It applied not only to treatment for the crisis of Addison's disease, but also to the maintenance of chronic patients. Loeb's findings explained the salt hunger which so frequently is encountered in Addison's disease. Allers' observation was substantiated for us by a patient who, in addition to a craving for salt, which she satisfied, took generous quantities of sodium bicarbonate as treatment for a "sour stomach." The woman had done unusually well in preserving her weight and strength, for five years after she first became aware of asthenia and pigmentation. Therefore, the treatment of all patients was modified to include the administration daily of 10 grams of sodium chloride and 5 grams of sodium citrate. The benefit was striking.

Soon after this Allers, Nilson and Kendall (11) made another useful discovery. It was that restriction of the dietary intake of potassium facilitated the maintenance of adrenalectomized dogs with sodium chloride and sodium bicarbonate or citrate—no hormone being used—and that by this means the constituents of the plasma remained at perfectly normal levels. Investigators previously had revealed that potassium was retained in adrenocortical insufficiency, and Hastings and Compere (12) long since had commented on the possible bearing of this retention on the development of the manifestations of adrenocortical insufficiency; also Loeb, as I have stated, had found the concentration of potassium in the blood plasma of patients in crisis to be increased out of proportion to the loss of water from the blood. The information, however, received no practical application until

Nilson (13) showed that even relatively small amounts of potassium given by mouth would precipitate crisis in dogs that were being maintained with sodium salts on a diet low in potassium, and that for the continuous maintenance of such animals a dietary intake low in potassium was highly beneficial.

The information relative to potassium immediately was applied with advantage to the patient with Addison's disease, as was shown in a metabolic study reported by me, with Kendall, Snell, Kepler, Rynearson and Adams (14, 15), at the 1937 meeting of the Association of American Physicians. The evidence demonstrated that an intake of potassium of not more than 4 grams would provoke an increased excretion of sodium and chloride and precipitate symptoms of crisis in patients not receiving cortical extract; that large doses of sodium chloride and sodium citrate would mitigate but not prevent these effects, and that limiting the intake of potassium would greatly lessen or eliminate the need for extract.

Additional experience has provided ample confirmation of these conclusions. It appears that the tolerance for potassium of man and animals depends on the competency of the cortical tissue of the adrenal glands. Bunge estimated that Irish laborers, living largely on potatoes, ingested as much as 50 grams of potassium a day, and Keith and his associates, with no ill effect, frequently have given from 9 to 12 grams of potassium to patients with nephritis, as a diuretic. In contrast to this apparent harmlessness of enormous quantities of potassium in health, is a peculiar sensitivity to this ion in conditions of adrenocortical insufficiency. Allow more than 2 grams a day in the diet of a patient with Addison's disease and his life becomes extremely hazardous. He then can scarcely be maintained without large doses of hormone. Restrict the intake to less than 2 grams daily and very little or no hormone will be required, provided sodium chloride and sodium citrate are given. Directions for the preparation of diets low in potassium have been published by Sister Mary Victor (16).

Statistical data on the results of treatment in Addison's disease are difficult to interpret, because occasionally long survivals occur without any treatment. One patient, whose case was included in the report made by Snell, was pigmented and weak for seventeen years before suffering an attack of crisis. However, such extended survivals are few, and probably it is fair to assume that as many were included in the forty-six cases reported by Snell in 1933 as are to be found in the group of cases treated since that year. The last survey of results was made July 1, 1937 by Rynearson, Snell and Hausner (17). The cases almost equal in number those in Snell's report, and the period of time was about the same as that covered by Snell. It was gratifying, therefore, to find that twenty-four of the forty-three patients treated during the later period were alive at the end of the period. Not only this—the condition of the survivor in most cases was better. Nor did all of the forty-three patients in this later series enjoy the advantage of all the newer knowledge available. Those that died included a disproportionate number who were seen before it all became available. So I am sure that when another review is prepared the percentage of survivals will be still more encouraging.

Favorable results in the treatment of Addison's disease depend on the ability of the patient to adhere to the rather complex instructions that need to be given. For this reason comparison of the survivals in different clinics is unjustifiable. We, in Rochester, Minnesota, are handicapped by the fact that most of our patients come from a distance and must depend to a large extent on themselves after their dismissal from the hospital. On the other hand, the average of their intelligence is higher probably than that of the clientele of the large charity hospitals in the cities; also their economic status is superior; both of these factors can be expected to influence our results in a favorable direction.

It is on the books that a synthetic preparation with adrenocortical activity will be available before long. This probably will greatly reduce the cost of substitution therapy in Addison's disease and increase its efficiency. In the meantime, it seems reasonable to conclude, from the experience which I have related, that treatment by restriction of potassium and administration of extra sodium chloride with sodium citrate, can be depended on to prolong the lives of patients and maintain them in fairly good physical condition. Usually we advise the periodic administration of cortin as a precautionary measure. This is chiefly because so many of our patients live at a distance. Our advice about this, however, in many cases, chiefly because of the cost of the commercial preparation of cortin, has not been followed. In the reports received by Rynearson, Snell and Hausner ten of the twenty-four patients who had survived had not taken any cortin since their dismissal.

THE DIAGNOSIS OF ADDISON'S DISEASE

The diagnosis of adrenocortical insufficiency in man is a problem of some complexity. The complete syndrome described by Addison is not difficult to recognize, but the characteristic pigmentation of Addison's disease is inconspicuous or absent in some cases of frank insufficiency, and the other features of the addisonian syndrome, namely asthenia, low blood pressure, loss of weight, anemia and anorexia, are met so frequently in other diseases, or, independently of recognizable organic disease, in patients with chronic nervous exhaustion, psychasthenia or simple bioplasmic inferiority, that to base a diagnosis on them is highly risky. Some years ago Camp, Ball and Greene (18) called attention to the occasional possibility of demonstrating calcification in tuberculosis of adrenal glands. By making roentgenograms of the glands with the patient in the oblique position, evidence of deposit of calcium was disclosed in six of a series of twenty-three consecutive cases. The procedure is quite helpful if calcification is found, although the presence of calcium in lymph nodes in the vicinity of the glands, or in the cartilages of adjacent ribs, may be misleading, and very rarely, in apparently normal persons, shadows have been seen corresponding to those observed in Addison's disease. A negative result means nothing, and a serious objection to the procedure is that patients with true adrenal insufficiency are uncommonly sensitive to roentgen irradiation and may be thrown into a critical condition by much exposure.

In acute adrenal insufficiency, characterized by the addisonian crisis, assistance may be obtained from chemical examination of the blood. The finding of high values for nonprotein nitrogen and potassium, and of low values for chloride, sodium and sugar, is very suggestive. Such values are not diagnostic, however, as has been emphasized by several investigators (19–25), and the absence of all of them does not exclude the existence of chronic adrenocortical disease.

Very important diagnostically is the effect of a period of deprivation of salt. Based on Loeb's observations, to which I have referred, this test for adrenocortical insufficiency was introduced by Harrop in 1933. It subsequently was modified to control the intake of potassium, an additional consideration made necessary by the finding, of which I already have spoken, that patients with Addison's disease will tolerate restriction of sodium salts if their intake of potassium is restricted. The test originally was performed by subjecting the patient to a diet very low in sodium chloride, and the diagnosis was considered positive if symptoms of crisis were associated with lowered values for sodium and chloride in the blood and elevated values for nonprotein nitrogen and potassium. The modification of the original procedure, in use in The Mayo Clinic since 1935, is as follows: On the first three days of the test the suspect is given a diet containing 4 grams of potassium and potassium citrate* is added to bring the intake of potassium ion to 6 grams daily. On the last three days of the test enough potassium is given to increase the daily total to 9 grams.

There are numerous objections to this procedure, even as modified to insure an adequate intake of potassium. The chief one is the state of collapse into which the patient may pass before the values for the electrolytes in the plasma have changed enough to be diagnostic. Lilienfeld (26) recently reported a fatal accident of this nature. Furthermore, at least one false positive result has been obtained. This concerned a patient with latent insufficiency of sclerotic kidneys. Additional disadvantages are that the test requires six days for completion, and that the final

* One gram of potassium is contained in 2.8 grams of potassium citrate.

interpretation depends on examination of the blood for sodium and potassium, procedures which necessitate technical facilities not widely available.

Recently Zwemer and Truszkowski (27), impressed by the intolerance for potassium encountered in adrenal insufficiency, have proposed as a diagnostic procedure giving 10 to 20 mgm. of potassium per pound of body weight, and at short intervals examining the effect of this on the level of potassium in the plasma. Subjects without adrenal insufficiency revealed only a slight rise in this value, with early return to normal; whereas in cases of Addison's disease the rise was two or three times as great and the return was somewhat retarded. The response, however, is uncertain. Gordon, Kimble and Sevringhaus (20), applying the procedure in cases of asthenia, in normal subjects and in cases of Addison's disease, concluded that "it failed to afford any consistent basis for distinguishing between the three types of subjects." Another objection is the necessity for determining potassium in the blood; even in the best-equipped laboratories this determination is difficult and exacting, and few clinical laboratories are equipped for it.

Injection of insulin has been proposed as a diagnostic procedure, but this has not been helpful. The rationale is the known hypersensitiveness to insulin of patients and animals with adrenocortical insufficiency. The difficulty encountered is that many other conditions are associated with hypersensitivity to insulin. The same objection applies to the use of epinephrine.

Unless a simple technical procedure can be found whereby the state of efficiency of adrenal glands may be determined with accuracy, a great many persons, suffering with nondescript asthenia, unnecessarily, and perhaps with ultimate injury, will be given preparations of cortin. The danger will become acute as soon as a synthetic, cheaper preparation becomes available. Furthermore, loose thinking about adrenal function will be promoted. Thus, a therapeutic test for Addison's disease already has been proposed, based on response to treatment with cortin. Subjective improvement, rise in blood pressure and increased weight and appetite, are accepted as indications of preexisting adrenocortical insufficiency. When these evidences of benefit are encountered the treatment presumably is to be continued. However, the majority of endocrine preparations possess nonspecific pharmaceutic effects. Thus, patients with normal basal metabolic rates who are not deficient in thyroid activity frequently are benefited subjectively by medication with thyroid extract, as they might similarly be benefited by doses of strychnine. The same undoubtedly is true for extracts of adrenal cortex. In a case reported by Kline (22) the patient, with an asthenia previously benefited by treatment with cortin, had so little trouble with his adrenal glands that he was able to tolerate perfectly a nine-day period of rigid restriction of sodium chloride. Later, with injections of sterile water, he was subjectively as well off as before. We have had similar enlightening experience. A number of patients who under our observation withstood a six-day period of restricted sodium chloride without harm, came to The Mayo Clinic with a diagnosis, made elsewhere, of Addison's disease, and the story of subjective improvement following treatment with cortin. Several of these people seemed actually to have been benefited by a diet made low in sodium and high in potassium.

Some observations made with Cutler and Power (28) were reported before the Association of American Physicians in 1938, at Atlantic City. They had to do with the excretion of chloride and other electrolytes in the urine of patients with Addison's disease. Certain conditions were imposed, as I shall relate, but under these conditions the concentration of urinary chloride, a determination which technically is as simple a biochemical procedure as can be named, proved to be more reliable, as an index of adrenocortical insufficiency, than any other factor under observation except concentration of sodium in the urine. In eight of nine cases of proved Addison's disease the concentration of urinary chloride exceeded 225 mgm. per cent. In twenty-eight control subjects the highest value was 141; the others were under 125. The subjects without Addison's disease included ten healthy men and women, six patients with nondescript types of asthenia, seven patients with tuberculosis and five with miscellaneous diseases.

Values between the figures named (141 and 225 mgm. per cent) are inconclusive, and when obtained in any examination will necessitate a longer period of observation and other analyses. However, in our experience such an intermediate value occurred in only one patient who subsequently could be shown to have adrenocortical insufficiency. In a preliminary study with somewhat different conditions, the concentration of chloride and sodium in the urine of eight other subjects who had Addison's disease was greater than that found in a group of eight subjects without evident disease of the adrenal glands. Thus, in all, seventeen patients who had Addison's disease and thirty-six control subjects have been examined.

The conditions described for the preparation of the patient and the conduct of this examination, as finally standardized, are as follows: For twenty-four hours before beginning, the patient should have received no further chloride or other salts containing sodium or chloride, beyond the amount of sodium chloride normally contained in the properly seasoned food. The examination lasts three days, and for these days the diet contains not more than 1.5 gram of sodium chloride and approximately 4 grams of potassium. On the afternoon of the first day and on the morning of the second, potassium citrate is administered in dilute solution by mouth, in a dose of 0.1 gram for every kilogram (2.2 pounds) of body weight. Drinking of water is encouraged; 40 cc. of liquid for every kilogram of body weight (18 cc. per pound) is provided on the second day, and 20 cc. for each kilogram is given before 11:00 on the morning of the third day. The urine for examination is that passed after 8:00 a.m. of the second day. Collections are made between 8:00 a.m. and 8:00 p.m. of the second day, from 8:00 p.m. of the second to 8:00 a.m. of the third day, and from 8:00 a.m. to noon of the third day. The last of these collections gives the most reliable result, but if a state of collapse develops earlier, the concentration of chloride in the earlier specimens seems to tell the same story.

The danger of collapse from this procedure is much less than that attending resort to longer periods of restriction of salt. In only one case of Addison's disease was it necessary to conclude the examination before the morning of the third day. Nevertheless, some hazard attends even so short a time of restriction of salt; therefore, room-rest and continuous nursing must be provided, so that if collapse does occur, restorative treatment can be given without delay. For collapse, and at the close of every examination in which a diagnosis of Addison's disease is probable, an intravenous injection should be made of 1000 cc. of sterile solution containing 50 grams of dextrose, 10 grams of sodium chloride, 5 grams of sodium citrate and 20 to 40 cc. of an active preparation of cortical extract. This solution, or the constituents thereof, should be on hand from the beginning of the examination.

Anderson and Lyall (29) also have proposed that "loss of chloride conserving power" be made use of in the differential diagnosis of Addison's disease, especially in cases without pigmentation. In the absence of evidence of diabetes or renal disease, they said, "the finding of a chloride concentration in the urine of over say 200 mgm. per 100 cc. (representing 121 mgm. per cent of chloride ion), when the plasma chloride concentration is below the minimal normal level of 530 mgm. per 100 cc. (representing 320 mgm. per cent of chloride ion), would strongly suggest the presence of Addison's disease." The difficulty with this proposal, as we soon found, is that the plasma chloride ion of patients with chronic adrenocortical insufficiency is usually higher than 320 mgm. per cent, and even under the provocative conditions imposed by our procedure it sometimes did not fall to this level. That the stipulation of a given level for the chloride in the blood is unnecessary is illustrated in a chart (fig. 1), in which the concentration in the urine is plotted against that in the plasma. It is apparent that most of the subjects with Addison's disease, shown by the triangles, had plasma levels higher than 320 mgm. per cent. The chart also shows that the figure of 121 mgm. per cent, set by Anderson and Lyall for the concentration of chloride ion in the urine, is too low; a few of our subjects without other evidences of Addison's disease had concentrations higher than this.

I mentioned that one of our subjects with Addison's disease failed to show concentration of urinary chloride higher than the low limit regarded as diagnostic; namely, 225 mgm. per cent. In this case pigmentation was typical and intense, and the symptoms included so marked a loss of weight and strength that those who saw the patient were in no doubt about the diagnosis. The urinary concentration obtained in the four-hour specimen of the morning of the third day of the special examination was 155 mgm. per cent, 15 mgm. above the highest value in any of the subjects who

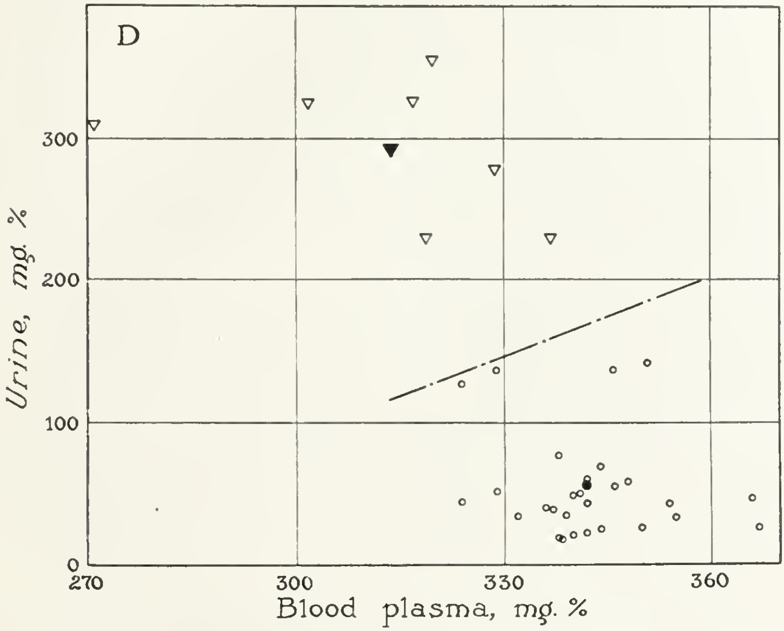


FIG. 1. Concentration of chloride in four-hour collection of urine, on morning of third day of deprivation of sodium chloride. Triangles represent Addison's disease; circles, controls.

proved not to have Addison's disease, disquietingly lower than the values obtained in all the rest of the cases of Addison's disease. After salt had been restricted for two more days nausea and increasing weakness developed, together with blood chemical evidence of diagnostic significance. A possible explanation of this delayed reaction is that a tuberculous lesion principally affected the medulla of the adrenals, leaving the cortex relatively intact. It has been supposed by many that involvement of the chromaffin tissue of the medulla is responsible for the pigmentation of Addison's disease, whereas it is well established that the disturbance of electrolyte balance depends on involvement of the cortex. It long has been recognized that occasional patients with Addison's disease may survive without any treatment for many years. I mentioned a case reported by Snell, in which the patient was deeply pigmented and asthenic for seventeen years before he developed severe adrenocortical insufficiency. Such long survivals are met with in cases of tuberculous etiology. The pigmentation in them is usually intense, and the explanation I have suggested has been given before by others, namely, destruction of the medulla with relatively little damage to the cortex. It is well known from Biedel that only a small portion of functionally efficient cortical tissue will provide what hormone is essential.

Additional experience must be had before confidence can be placed in the reliability of the diagnostic procedure I have described, but it is my opinion that cases of Addison's disease, like the one mentioned, in which the concentration of urinary chloride falls below 225 mgm. per cent—under the conditions named—will be few, that they will be cases like the one described, in which the pigmentation is so typical that laboratory confirmation is hardly necessary, and that very few, if any, unpigmented patients with nondescript asthenia will show a concentration higher than 125 mgm. per cent.

BIOCHEMIC AND PHYSIOLOGIC STUDIES

I made the statement that a cheaper and much more effective preparation of adrenocortical hormone could reasonably be expected in the near future. For an explanation we must leave the wards and pass into the laboratories. The active agent in extracts from adrenal cortex was named "cortin" by Hartman and his associates (30), but later investigations have shown that several compounds can be separated from such extracts, all of them closely related, and that at least four of these in varying degrees possess activity like that of the cortical part of the adrenal gland.

Kendall (31) and his associates, Mason, Myers, Hoehn and

McKenzie, have obtained three crystalline compounds, A, B, and H, from the residues of extractions with benzene. About 1 gram of compound A and a like amount of compound B are obtained from 3000 pounds of glands. Compounds A and B have the same melting point, but differ in crystalline form and in specific rotation. They are members of what Kendall designates the O_4 series; they are $C_{21}H_{28}O_4$ and $C_{21}H_{30}O_4$, respectively. Also present is another series of compounds more soluble in water and with empiric formulas from $C_{21}H_{28}O_5$ to $C_{21}H_{36}O_5$. This is the O_5 series. From them compound E has been separated by fractional crystallization from absolute alcohol. About 1.4 gram of compound E is obtained from 3000 pounds of glands. It is of peculiar interest, because when oxidized with chromic acid a triketone of nineteen carbon atoms is found, which possesses androgenic activities.

The structure of compound A, as isolated, is the same as that of progesterone with an hydroxyl on C_{21} and a ketone group at C_{11}. Compound B, which Kendall has shown to be identical to the corticosterone isolated in crystalline form by Reichstein, possesses the same structure except for an hydroxyl group in place of the ketone at C_{11}. The results of the chemical investigations can briefly be summarized by Kendall's statement that "both the O_4 and O_5 series of compounds appear to be hydroxyl or ketone derivatives of progesterone." Thus it appears very probable, he says, that compounds with cortin-like activity soon will be synthesized from sterols that are more accessible than those in the suprarenal cortex.

Compounds A and B of the O_4 series possess qualitatively all the activity characteristic of the original extract of the glands, and compounds E and F tested by Ingle's rat test seem to be equally active. Quantitatively, however, none of these crystalline compounds is as active as a noncrystalline fraction in the original extract of the glands. After removing the crystalline compounds from the extract, an amorphous fraction can be separated which is many times more active than compound B. As little as 1 or 2 micrograms of this amorphous fraction per kilogram of body weight per day is sufficient for the maintenance of adrenalectomized dogs, whereas the same number of milligrams of compound B are required to obtain comparable activity. It thus is shown that compound B, the "cortico-sterone" of Reichstein, is not the most important product of the suprarenal cortex, and therefore possibly should not be given that appellation. It would be better, it seems to me, to reserve the name "corticosterone" for the actual hormone. Compound B and the other fractions thus far isolated in crystalline form are all related in a manner similar to the relations existing between theelin and dihydrotheelin, or pregnandiol, pregnandione and progesterone, or androsterone and testosterone. Thus they probably represent products resulting from the potential degradation of an original, potentially more active, product.

The standardization of preparations of adrenal cortex has presented a problem of extraordinary complexity. The difficulties have been so great, according to Kendall, that in any one laboratory if all dogs that are adrenalectomized survive indefinitely, and all are used for standardization, the absolute value of any one solution, expressed in dog units, may vary as much as 600 per cent. Standardization as it is carried out today in different laboratories may contain errors which are of the order of from 800 to 1500 per cent.

More uniform standardization is provided by a method devised by Ingle (32). In it adrenalectomized rats are anesthetized with phenobarbital, and the gastrocnemius muscle is stimulated three times a second by a silver electrode placed in the muscle. A 100 gram weight is attached to the tendon. The time during which the muscle contracts and the total distance through which the weight is lifted are measured by a recorder. The advantages of the method are that only a short time is required for a determination and that the amount of material consumed is small. By definition, cortin-like activity means that there must be ability to maintain the life of adrenalectomized animals, and to maintain within normal limits the nonprotein nitrogen, sugar, chloride, sodium and potassium of the blood. However, it has been found that products active in maintaining the capacity for work of adrenalectomized rats by Ingle's test also possessed the other properties named, the statement applying not only to the unfractionated extracts of adrenal cortex, but to each of the crystalline fractions thereof.

Another very important property of these products has been demonstrated recently by Long (33), using crystalline compound B supplied by Kendall. The adrenal glands have been known to play a part in carbohydrate metabolism, by virtue of adrenalin supplied by the medulla. The work of Long and Lukens, however, has shown that the cortex also is involved. Removing only the cortex suppressed glycosuria in partially depancreatized rats, and administering Kendall's compound B to these animals caused the sugar to return. Together with other work by Long and Lukens, this raises the interesting question as to whether the diabetogenic effect of the anterior lobe of the pituitary body may not be brought about, in part at least, through stimulation of the adrenal cortex. In several cases of adrenocortical tumor studied by Kepler and me (34), evidence has been obtained of disturbance of carbohydrate metabolism. In such cases the adrenal cortex is the part of the gland involved, and the medulla usually is unaffected. The incidence of poor tolerance for d-glucose in cases of adrenocortical tumor is as great as that which occurs in cases of the syndrome described by Cushing, in which a basophilic adenoma of the pituitary body is the only anatomic abnormality in evidence. This also suggests that the diabetogenic action of the pituitary may be brought about by way of the cortex of the adrenal glands.

SUCCESSFUL HOMEOGRAFTS OF ADRENAL CORTEX

Encouraging as they seem to be, the most that can come from efforts to prepare a synthetic substance with cortin-like activity will be something to replace what is permanently lacking in Addison's disease. The patient still will require treatment as long as he lives. To accomplish a lasting cure, some way must be found to transplant adrenocortical tissue successfully. For this reason I must speak about some recent work in which Ingle has been engaged with Higgins. In white rats, autografts of cortical tissue, by which is meant transplanation of the tissue to a different site, for instance to the ovary or the groin of the same animal, are almost invariably satisfactory. However, successful transplants from one animal to another of the same species, so-called homeografts, have been obtained in the past infrequently. The failure of homeotransplants to grow is attributed to some biologic incompatibility displayed by the host toward the graft. This in turn is said to depend on differences in biologic and chemical characteristics, so-called organismal differentials, which in turn are a consequence of the genetic constitution of the individual.

Stone, Owings and Gey (35, 36), in Baltimore, ingeniously attempted to overcome this obstacle by a procedure designed to accustom the cells to be grafted to the tissue fluids of the prospective recipients. The tissue of the donor was cultured in media to which could be added at first a little and then more of the blood serum of the prospective host. Successful transplants were obtained of thyroid and parathyroid, and the reports were a stimulus to Higgins, who undertook the laborious task of acquainting himself with the methods of tissue culture and, together with Lux and Mann (37), successfully repeated Stone's procedure. While he was engaged in this study, however, Higgins, jointly with Ingle (38), succeeded in obtaining satisfactory homeografts of adrenal glands of white rats without previous conditioning, and found, for the adrenal cortex, that quite as high a proportion of successful transplants was obtained by this more simple means, provided the tissue for grafting was taken from newborn animals. The older the host, the fewer were the takes, an observation which also is in harmony with established biologic concepts,—namely, that the specific biologic and chemical characteristics of tissue—the so-called organismal differentials—are developed later in life.

The results of transplanting the adrenal glands of newborn rats have been very encouraging. When the homeografting is done within a closely inbred strain, the percentage of successful takes approximates 100; but even with no blood relationship between the infant donor and the adult host, 60 per cent of the transplants survive and the rats remain in good condition. An initial loss of weight occurs; later, in the successful operations, the animals gain and appear normal. The host, it should be stated, must be adrenalectomized at the time the graft is made. Neither homeografts, nor even autografts, will grow or function otherwise. Halstead's law that a factor of deficiency governs regeneration of engrafted glandular tissue holds absolutely.

Four months are allowed to pass in these transplanting experiments, a period of time long enough for the grafted tissue to be destroyed if the transplant fails. In case of failure the animal dies with symptoms of adrenal insufficiency. The transplants are placed in the fascia along the femoral veins, and after four months, when the groins of the living animals are explored, a small cluster of nodules is found firmly attached to the femoral vessels. Death follows the removal of these new glands. The agonal symptoms again are characteristic of adrenocortical insufficiency, and histologic examination reveals that the transplants are composed of cells with the morphology of the cortex of the adrenal gland.

Rutishauser and Guye (39) also have succeeded in making homeografts of suprarenal tissue from newborn rats, so that there now is good reason to hope that similar successful results may be obtained in Addison's disease, provided adrenal glands from stillborn, normal human infants can be made available.

I should like to have time to speak of other observations of Ingle and Higgins. They have shown quite definitely that some stimulation received from the anterior lobe of the pituitary is necessary for the regeneration and growth of transplanted adrenal tissue. I cannot omit mention of the effect on such regeneration of injections of cortin, because this has immediate clinical significance.

I emphasized before that a positive therapeutic test with cortin provides invalid evidence that a patient is deficient in adrenocortical activity, and that the treatment of asthenia with cortin, unless the asthenia is truly a result of loss of adrenocortical tissue, may be injurious. Until recently these statements depended exclusively on clinical experience. The surgical removal of tumors of the cortex of adrenal glands, when the patient exhibited the symptoms of the adrenocortical syndrome, was formerly extremely hazardous. The patient succumbed to what was supposed to be shock; it more probably represented acute adrenocortical insufficiency, because in many of these cases the gland opposite the one which harbored the tumor was atrophic. In other cases it might be assumed that the shock-like syndrome developed because the remaining gland, although not apparently diminished in size, was functionally incapable of secreting an adequate amount of hormone. We found, then, that by treating such patients before and after operation with measures which are effective in the crisis of Addison's disease, the deaths could be avoided, and since adopting this procedure not one shock-like reaction has been encountered. One death has occurred, but this was attributable to a complicating parotitis followed by bronchopneumonia.

I previously have called attention to this clinical experience (40), and expressed the opinion at the time that production of cortical hormone by the tumor caused afunction of what normal adrenal cortex remained. Now Ingle, Higgins and Kendall (41) have shown conclusively in animals that the administration of cortin prevents the regeneration and growth of transplanted adrenal tissue, and that injections of large amounts of cortin into normal rats cause atrophy of the cortices of their adrenal glands. The ill effect is attributed to a dampening influence on the adrenotropic activity of the pituitary, a conclusion which they support with additional experimental evidence.

This evidence that administration of cortin provokes atrophy of the cortices of normal adrenal glands should warn against chronic treatment with cortin of patients with nondescript asthenias. The doses of the hormone used in the experimental work of Ingle and Higgins relatively were very much larger, it is true, than those now available for clinical use. However, the effect of smaller doses, given for longer periods of time, may very well be equally injurious. For this reason it seems to me the part of wisdom to insist on obtaining a negative response to some such diagnostic test of adrenocortical activity as my associates and I have described, before resorting to cortin in the treatment of asthenia of unknown etiology.

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The Cellular Organization of Nervous Function*

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Our present conceptions of nervous structure are, to a very considerable extent, based upon the neurone hypothesis of discontinuous units. Were we not able thus to think in terms of the cellular nature of its organization, the nervous system would be an incomprehensible mass of protoplasm, instead of a fascinating arrangement of cells in trunks and tracts, systems and centers. For upon such a basis of understanding the physiologist has been enabled to describe the functional interrelationship between organs, the neurologist and pathologist have made their diagnoses, and the surgeon has been guided to a rational operative procedure. These accomplishments are the fruits of the brilliant work of past generations of histologists. By their well-established observations they have settled the frontiers of those days and have thus provided a starting point for expeditions into still unexplored fields of neurology.

During that period in which the microscopic structure of the nervous system was being resolved, another and smaller group of scholars was attempting to understand the functional mechanisms of the system. Among those pioneers Weir Mitchell occupies a distinguished position, because he was a leader in such work here in the United States, and because he developed the functional point of view in both the laboratory and in his clinical practice. It is interesting to consider, however, that although he has been recognized as the father of American neurology, neurology has not flourished most in those fields which he loved and cultivated.

* S. Weir Mitchell Oration VII, College of Physicians of Philadelphia, January 5, 1938.

The great clinical advances have instead been in diagnosis, in neuropathology, and in neurosurgery, which have been motivated and inspired by the findings of the anatomist. On the other hand, our knowledge of functional mechanisms with which Weir Mitchell was so significantly associated has not until recent years developed to a stage at which it offered any considerable promise to the clinician. At last, however, a new era in neurology is beginning, founded upon our greater understanding of how the nervous system works. From this understanding there will develop clearer conceptions of the causes which produce pathological changes. Out of that understanding should certainly come the knowledge which will enable us to control the activity of the nervous system and, thereby, enable us more effectively to diagnose, to cure and to prevent nervous disease. One may, therefore, say that Weir Mitchell was more truly the grandfather of the American neurology which is only now beginning to develop.

II

To understand the actions of a crew of explorers aboard their vessel, one must know the influence of the winds and currents they encounter, one must know the course they sail, and the port they seek. Because it is my purpose this evening to relate the results of certain scientific adventures of a small group of friends working in the laboratories of Cambridge University, of Washington, Chicago and Harvard, in the Rockefeller Institute and in the Johnson Foundation here in Philadelphia, I should tell you of the natural forces we dealt with, the experimental course we have followed, and what we have found upon the new shores we visited. And, lest you think our quest aimless, I will first tell you what we seek.

That objective is, in brief, an understanding of how the nervous system normally functions. We are striving to attain such an understanding in terms of the properties and activity of the single neurone, explained in terms of the laws of physics and chemistry. For we believe that all nervous activity is compounded out of the behavior of the individual cells, and that, if we can determine their properties, we shall be able to integrate that knowledge into a better understanding of the nervous system as a whole. In this way we hope to achieve a conception of the causes of mental and nervous disease which will make possible their more effective control and cure. It is our belief that this knowledge of the unitary and the integrated activity of nerve cells will, therefore, initiate a new era in neurology comparable in importance with that which followed the unitary analysis of the structure of the nervous system.

III

Experimental research depends upon precise measurement. If, therefore, we are to determine the properties and the behavior of a nerve cell, we must find some measurable index or sign of its activity. Until recently we have had to depend upon the response of effector organs in voluntary and reflex action and upon subjective studies of sensation for indications of what is going on within the nervous system. Such responses have revealed much concerning nervous behavior, but they define rather than solve the problems with which we are concerned this evening. For they are the net result of the activity of a vast number of determinate cells, and it is the behavior of these individual cells which constitutes the basic problem of organic integration.

There is another considerable advantage to be gained by working with the units of the nervous system rather than with the more complicated end results. It is that in such an analysis no dualistic philosophy need confuse us regarding the relative significance of mind and matter. For few will question the existence of the units as other than molecular aggregates, and we may, therefore, proceed immediately to consider them in terms of physical and chemical forces.

Nor need we make any distinction between the physical and chemical approach, for here, as in many other fields of modern scientific investigation, the two are separable only with difficulty. The stability of a molecular configuration and the rate of chemical reactions in a biological structure are determined by electrical forces between the molecules. And conversely, any change in a molecular arrangement is revealed as a variation in the electrical potential of the system. It is not surprising, therefore, that changes in the electrical characteristics of nerve cells have been the most delicate and useful indicators of what is going on within them.

IV

This is because a living nerve cell is no fixed, static entity such as that which we view in a histological preparation. Rather, it is, as I have indicated, an assemblage of molecules and atoms held together in a certain pattern by electrical forces. This pattern is not stable, but is continually tending to disintegrate, and only by an expenditure of energy does it maintain itself in that state of dynamic equilibrium which characterizes a living neurone. Any alteration in the physical or chemical environment of the cell throws this unstable system out of balance, and thereupon a wave of change spreads along the nerve fiber. Each disturbed region constitutes an altered environment, and consequently a stimulus for the adjoining portion of the cell. After the intimate structure of the cell has been thus disorganized or thrown out of balance, energy is required to re-form the original state, and this energy is greater than that needed to maintain its structure while at rest. A nerve cell is, therefore, continually requiring energy in order to maintain itself in such a condition that it will be able to go into action; and having been in action, it needs still more energy to prepare it for further action.

Such a conception of the energy requirements of nervous tissue appears reasonable enough at the present time, but it is of relatively modern vintage, for only recently have we been able to achieve an idea of nervous mechanisms in such dynamic terms. That these are fundamental factors in the type of nervous treatment made famous by Weir Mitchell is not improbable. It is safe to say that as we come to know more about the effects of disturbances in the energy supply of the nervous system we shall be better able to trace the etiology of many nervous and mental diseases.

Not only energy but time is needed to reset the nerve cells for further activity. As that alteration of structure, which we may now refer to as an impulse, sweeps past a certain region of the nerve fiber the electro-chemical processes of stabilization are accelerated and become the forces of restoration and recovery. During the brief period of a thousandth of a second, however, the intimate structure of the nerve is still disorganized, and so it cannot again respond to a change of environment until the recovery processes have run their course,—at least in part. This fact is of fundamental importance, for it implies that the processes of excitation and conduction within a nerve cell are periodic and are not continuous—and this then accounts for the characteristic rhythmicity of the nervous system. Because of this property of nerve cells we will be prepared to find, in dealing with the activity of the nervous system, that we are primarily concerned with events rather than with stable states.

I do not say, however, that there are no continuous processes in nervous tissue, for there are. Thus the cell body exerts a continual metabolic influence on distant portions of the cell, and the chemical reactions which provide the energy necessary for maintaining the steady state are not periodic. What I do wish to emphasize is this. When we deal with the results of changes in the environment of a nerve cell, we are primarily concerned with trains of events, and by such a rhythmic sequence of events in its many parts the nervous system executes its function of maintaining the organism in its proper relationship to the environment.

V

This is reminiscent of Herbert Spencer's definition of life as: "The continuous adjustment of internal relations to external relations." Stated otherwise, the vitality of an organized system depends upon its adaptability. The capacity to survive: of a social group facing changed circumstances, of an individual in an altered social or physical environment, or of a single living cell subject to changing forces—all depend upon their ability to modify their properties, and consequently their activity, in accordance with those changed conditions. Thus they can function most effectively in whatever environment they chance to be. The more extensive and rapid the changes to which they are subjected, the more exacting are the demands upon the adaptability of the system; the greater the diversity of specialized units within the system, the more highly developed must be the mechanisms for achieving adaptation of the parts and of the whole.

In carrying out such functions for the highly integrated vertebrate, the nervous system places great dependence upon the sense organs which serve as the outposts of the organism. In these terminal portions of the sensory nerve fibers there has been developed an extraordinary sensitivity to the state of their surroundings, and in these structures originate the events which ultimately give rise to conscious sensation and to the correlated action of the organism which underlies its well-being.

Let us then turn to a consideration of how these sensory receptors function and of their rôle in nervous organization. In doing so we have found no better measure of their activity than the sequence of events in the nerve fibers which connect them with the spinal cord and brain. By observing these events we have been able to learn both something of the way in which they react to their surroundings and the nature of the messages which they transmit to the brain.

Having already considered the characteristic properties of a nerve fiber, we can anticipate with some assurance the fundamental nature of these messages. They will be trains of impulses which follow one another at certain definite intervals of time. During those intervals the nerve structure will be undergoing a process of rebuilding or reorganization. As each successive portion of the nerve is reached by the impulse, the structure of the nerve undergoes a radical change, which serves in turn as the stimulus for the adjoining region. Thus the impulse is propagated at a definite velocity to the end of the fiber, where it ultimately produces the effects upon which the integrated functioning of the nervous system depends.

To start the impulses on their way is the sole function of the sense organ. In this respect all sense organs are the same, for they cannot do otherwise than discharge such trains of impulses. This is an observation of fundamental importance. It may be explained by assuming that a resting, inactive receptor is maintained in a steady state of organization by a constant expenditure of energy. If light, or pressure, or stretch or heat energy acts on the appropriate receptor, and thus alters its structure, a propagated impulse is initiated. The structure of the receptor is now disorganized. But at the expense of energy, it is again restored, whereupon the stimulus again upsets the organization and another impulse is initiated.

On the basis of such an explanation, we should anticipate a sequence of impulses recurring at constant intervals, whereas we find the rhythmicity gradually decreases in frequency, starting at the very beginning of a constant stimulus. This is because the receptor possesses that very remarkable property of adaptation to which I have already alluded. Under the influence of a change in environment which acts as a stimulus, the properties of the cell are modified in such a way that it comes more nearly into equilibrium with its environment, which is then a less effective stimulus and, therefore, initiates impulses less frequently.

Some receptors possess this characteristic to such a marked degree that only one or two impulses are discharged before there is a complete adaptation to the new environment. Such are the touch receptors, including those in the ear, and certain receptors in the eye. They are, therefore, suitable only for response to a sudden change of stimulus, and do not weary the brain with continued reports of a constant environment. Those which provide the continued background of conscious sensation, however, adapt but slowly. Most of the visual receptors are of this type, as are those which respond to pressure in the viscera. The various receptors whose impulses stir up the sensation of pain and are, therefore, such valuable aids to the diagnostician show very little adaptation.

These differences among receptors, as regards their capacity for adaptation, suggest other differences which relate to their sensitivity to the environment.

In view of the discovery that all sense organs transmit the same kind of message to the brain, we are forced to assume that quality of sensation depends upon the particular group of cells in the cerebral pattern which is excited by the incoming impulses. This in turn depends upon the excitation of a particular group of sense organs. Accuracy of sensory perception and the unconfused working of the nervous system depend initially, therefore, upon the ability of a receptor to discriminate between different types of stimuli—that is, between different physical and chemical agents.

Let us consider two examples to illustrate how this is brought about. In the region of the carotid sinus there is located a type of receptor which is extremely sensitive to small changes in the oxygen content of the arterial blood, and which is relatively insensitive to fluctuations in the level of pressure within the vessel. On the other hand, there are in the same region receptors which follow every fluctuation in blood pressure, but respond only to extreme changes in the chemical composition of the blood.

Another illustration is provided by the sense organs of the retina. When they are illuminated by light of many wave lengths they send to the brain messages which give rise to a conscious pattern of color according to a mechanism which has been the concern of generations of natural philosophers. The discriminative rôle of the sense organs has, at last, been demonstrated by examining their response to various wave lengths of light. Thus we find that a given receptor will respond to many colors, but that it is vastly more sensitive to a certain one than to any others.

These two examples illustrate a general principle which may be stated as follows. Although all receptors have the potential capacity for responding to all types of physical and chemical stimuli, each type of receptor is so organized that it responds more readily to one agent than to another. These differences depend upon differences of structural arrangement, such as the projecting hairs of the cells in the inner ear, the photo-chemical substances associated with the receptors of the retina, and the ellipsoidal structure of the pacinian corpuscles which transform pressure into a stretch of the enclosed nerve. This differential sensitivity among receptors to various stimulating agents, coupled with a localized distribution of sensory impulses within the central nervous system, constitutes the basis for differences in quality of sensation, or specificity of reflex action.

It is well enough to talk of types of cells or receptors with the implication that all of a given type are alike structurally and functionally, but we should do so only if we are thinking qualitatively. The neurologist who considers the activity of single cells is continually forced to the conclusion that beneath apparent structural similarities there are marked differences in the more intimate structure which are now revealed only by differences in functional properties. Because of such facts the boundaries between structure and function are fast disappearing. I therefore venture to predict an anatomy of the future which will be concerned not with the microscopic picture of things caught as they are at one instant, and fixed, but with the shifting molecular arrangement which accounts for the functional properties of the cell. Nor should we forget that it is this which gives rise to what we see microscopically.

Consider, for instance, the differences of irritability among a group of pressure receptors. They may be identical in histological appearance, but some are so organized that they will respond to a pressure of as little as sixty millimeters of mercury, whereas their apparent counterparts may be so constituted that they will not respond unless the stimulus is twice as great.

Such variability is significant, not only as an indication of the importance of submicroscopic structure, but also as the basis for one of the important signaling mechanisms within the nervous system. As the intensity of the stimulus increases, the sense organs with higher thresholds are finally stimulated, and there is, accordingly, a parallelism between the degree of pressure, the loudness of the sound, or the brightness of the light on the one hand, and the number of sensory neurones in action. In this way the number of active units in the brain and spinal cord is controlled,—and thus the degree of nervous activity. This then is one means by which the activity of the neural organization is graded in accordance with the intensity of the environmental stimulus. A second depends upon the fundamental rhythmicity of action of each individual neurone.

VI

Let us consider the arrival of a nerve impulse in the central nervous system, reflecting at the same time on the fact that as the impulse reaches the termination of the sensory fiber, that fiber will at the synapse be in close approximation to another nerve cell. Without for the moment entering into a discussion of how the impulse bridges this discontinuity, we may say that it alters the environment of the adjoining cell, and thus the structure of the cell surface. This alteration may be sufficient to initiate a propagated impulse, in which event it will pass on to associated areas.

On the other hand, the change may be inadequate to discharge an impulse. In that case we might expect the altered state to persist until the arrival of the next succeeding impulse in the train, which would then carry forward the process of breakdown until finally excitation was achieved. Such is indeed the case—except for one important factor, and that is the now familiar process of adaptation. Because every nerve cell has the capacity to adjust itself to a changed environment, the altered structure is re-developed and, if there be adequate time between the successive impulses, each one will find the adjoining nerve cell just as difficult to excite as did its predecessor. If, however, the impulses follow one another more rapidly, each impulse will carry forward an uncompleted process, and ultimately the cell will be excited and will send into the cerebral pattern a wave of activity. The frequency of impulses in a nerve message is, accordingly, of great importance in the organization of nervous activity, for the higher frequencies will develop a greater effect in the centers.

It is, therefore, of interest to find that the frequency of impulses coming from a sense organ is generally determined by the intensity of the environmental stimulus. This is well illustrated by the behavior of a type of receptor located within the walls of certain blood vessels. By responding to the cyclic changes in blood pressure they originate messages which control the activity of the cardio-vascular centers. When the discharge of impulses from such a receptor is recorded together with an optical record of the arterial pressure we find that even minor variations of the pressure stimulus are represented with extreme fidelity as variations in the frequency of impulses which constitute the message.

Such fluctuations in the rhythmicity of action are the code in which the sensory nerve cells report to the centers the state of their surroundings. We may then draw the generalization that a change in any one factor of our environment acts upon the nervous system by modifying the number of sensory units in activity, and by determining the frequency of impulses discharged from the individual unit.

VII

The gap between this quite definite knowledge of the events which go on within the sensory unit and our relative lack of understanding of the higher nervous activity which they set into action is very wide indeed, but I do not believe it to be unbridgeable by scientific method. For if we knew all of the properties of each of two nerve cells, we should be able to predict the effect of one upon the other. And that is the underlying problem of functional organization. The complexity of anatomical organization is, however, a more serious obstacle, for I suppose a complete understanding of nervous and mental behavior would depend upon the impossible task of determining the anatomical relationship of every cell to every other cell. But the methods of psychology and psychiatry and experimental surgery have already brought us further than we dared to hope. Since such work may now be guided and interpreted in terms of the fundamental processes which determine nervous activity, we may look forward to an even more rapid advance.

Our immediate problem begins with an impulse at a synapse. For of the known means whereby cells in the central nervous system are excited, the most general is by an impulse in an adjoining fiber. How this is accomplished became one of the major queries of biology following the establishment of the neurone hypothesis with its postulated discontinuity between adjoining nerve cells.

One aspect of this problem is defined by the characteristic action of a motor nerve cell within the central nervous system. To determine this we have recorded the activity in a motor nerve fiber coming from its cell body and have thus found that it consists of a discharge of periodically recurring impulses. Variations in their frequency grade the action of the effector organ, as the frequency of sensory impulses grades the degree of central activity. How this rhythm is determined is a fundamental question which I wish now to discuss by describing three modes of cellular excitation.

The first is best illustrated by observing the response of the nerve cells in a sympathetic ganglion, for here the anatomical arrangements are simpler than in the central nervous system. We do not know that the processes of cellular excitation are the same in the two situations, but it would be surprising if they were entirely different. Our simple procedure, therefore, has been to send an impulse into the ganglion while recording the impulses which come out from the cell beyond the synapse. One clean-cut fact is revealed. The arrival of a wave of activity at the synapse causes the discharge of not more than one impulse from the cell. The rhythm of activity of a nerve cell excited by another is, therefore, in this case, the rhythm of activity of the incoming impulses, and, in many instances, a similar driving of the cells in the central nervous system results from trains of sensory impulses. This is one way in which the rhythmicity of cells within the centers is determined.

More often, however, a single volley of impulses going into the spinal cord initiates a rhythmic activity of the motor nerve cells which persists for some time. This prolonged response has been explained by assuming that impulses continue to arrive at each of the responding cells over pathways in which there are different delays for conduction time. Similarly, it has been suggested that such repetitive discharge, following a single volley of sensory impulses, may be due to the development of a single impulse in one neurone of a continuous chain, which then becomes self-exciting over and over again by the circulating impulses, once the chain is set in action. An impulse from the motor nerve cell would, therefore, result each time a certain neurone in the chain was excited. The hypothesis is of interest to us here, because it suggests a functional and anatomical basis for certain of the rhythms which make up the activity of the brain and spinal cord.

A third type of rhythmic activity is that which develops without being driven or triggered by afferent impulses. Such is the periodic discharge during a voluntary contraction or the rhythmic series of impulses from the respiratory or vaso-motor centers. The cells which send out these impulses may be excited periodically by similar trains of impulses in a preceding neurone, but the question would still remain as to what sets up the initial rhythm. It would seem necessary to assume, therefore, that certain cells in the central nervous system are capable of going through recurring cycles of activity due to some persisting or fluctuating alteration in an environmental factor and not to trains of incident nerve impulses. If sensory endings can be excited to give a rhythmic discharge by a steady stimulus, it is reasonable to assume that cells within the central nervous system do likewise. For I think it can be now stated with some assurance that all nervous tissue has potentially the same fundamental properties and characteristics, whether the organized protoplasm be in one type of cell or another, or whether it be in an axone or a sensory ending or a cell within the grey matter of the cortex. Not all of these properties will be manifest to the same degree, and some will be completely suppressed by modifications of environment and structure. But the basic properties are essentially the same, no matter what nervous structure we consider.

For example, let us compare a peripheral nerve fiber with one of these cells which discharge rhythmically without any apparent stimulus. Because the fiber is provided with an adequate supply of energy by its circulation it remains in an organized state, and it is therefore quiescent. If, however, a change of environment induces an alteration of structure, the fiber may go into activity, discharging groups of impulses from the treated region. This can be done by depleting the calcium supply of a nerve fiber or by interfering in other ways with the intimate organization of its protoplasm.

It is thus possible also to initiate recurring trains of impulses; and to regulate the degree of activity and the interval between successive trains by controlling the amount and rate of calcium removal. Such cycles of activity may be as rapid as several every second or as slow as one a minute. These relatively slow rhythms are apparently quite similar to many of the rhythms which characterize the activity of the central nervous system, such as the four to ten a second brain waves and the respiratory cycle. By some mechanism the rhythmic activity of the cortex or the sequence of impulses from the cells controlling respiration starts and then, after an interval, stops again for a period of rest. That such recurring activity in considerable portions of the central nervous system is due to the cycles of activity in the individual nerve cells seems likely from a consideration of the chemically induced activity in single axones, to which we have just referred. This is not surprising, for the cells of the centers are also under the influence of a chemical environment which determines their properties. When that environment changes, as for instance when the respiratory demands of the organism are altered, the properties of the respiratory nerve cells, and therefore the frequency of their rhythms, are likewise modified.

VIII

Thus far, we have found only these two mechanisms for producing rhythmic excitation of nerve cells—by nerve impulses and by chemical agents. In either case the response is due to an altered environment of the cell, and there are many reasons for believing that the processes are fundamentally the same in the two cases. In fact, the important theory of neuro-humoral transmission which has recently been developed employs the sensitivity of nerve cells to their chemical environment to account for transmission across the synapse. Having found that a small amount of acetylcholin is liberated by an impulse at the termination of some nerve fibers, many now assume that the presence of this substance will, during its short life, excite the adjoining cell body to discharge an impulse. Although the experimental evidence for this hypothesis has been largely obtained from a study of transmission and excitation in sympathetic ganglia, the concept is rapidly gaining favor as a general explanation of synaptic transmission throughout the nervous system.

There are some, however, who maintain that although acetylcholin is liberated at the termination of a pre-synaptic fiber it is not the only change in the environment of the nerve cell produced by an oncoming impulse. The degree of excitation, they say, is determined by the net effect of all these environmental factors. The rôles of the various physical and chemical changes associated with synaptic transmission have not yet been determined, but fundamental biological considerations demand that we consider cellular activity to be determined by the interplay of all the physical and chemical agents to which the cell is exposed. It is, therefore, not unlikely that the electrical potentials associated with the impulse and the acetylcholin and liberated ions all play some part in the process of transmission—the chemical sensitizing the surface of the cell to the stimulating action of the electrical change.

The fact that acetylcholin does act as such a sensitizing agent is shown by experiments in which we have stimulated the nerve going to a sympathetic ganglion while recording the impulses discharged from the cells within. When acetylcholin is injected into the circulation of the ganglion, cells which have previously not been excited by the incoming impulses are now stimulated to action, and this is shown by an increase in the number of post-synaptic cells which respond. It is, however, also possible to produce such a potentiation of the impulse at a synapse by means of various other chemical agents such as calcium and potassium. This again emphasizes the importance of considering nervous activity as the result of cellular changes induced by the manifold characteristics of the environment.

IX

Whenever the study of nature is carried beyond the stage of superficial description, man has found it necessary to think in terms of units,—the mathematician has his numbers, the physicist and chemist their atoms and electrons, and the biologist his cells. Having achieved such a resolution of the problem into its fundamental components, the thinking man then craves re-synthesis into relationships. The mathematician deals with assemblages, the chemist and physicist with the forces which build molecules into gross matter, the biologist sees his cells develop into tissues and organs. Similarly, the problems of neurology demand a study of the properties of the units of which the nervous system is composed, and then a determination of how they are related into an integrated organization which effectively regulates the organism as a whole.

Sometimes, however, it is difficult to retain the faith that even future generations will be able to explain the activity of the organism in terms of the cell. For such phenomena as the slow rhythms of sleep and the longer cycles of emotional change seem to be far removed from anything we know in these apparently simple units. But then comes the realization that the cells are not so simple after all and that there is still a vast deal to learn about their properties. And then, too, there comes the further realization that the cells are under the influence of an external physical environment about which we really know very little, and of a complex internal environment which is continually fluctuating, with effects which we are only now beginning to understand.

It is eminently fitting that a memorial to Weir Mitchell should take the form of a lectureship devoted to the recounting of advances in a field to which he gave his life. For a man's work is kept alive and made immortal through its development by succeeding generations.

The investigations described in this lecture, which were carried on at the Eldridge Reeves Johnson Foundation, were largely financed through the National Commitee for Mental Hygiene from funds granted by the Committee on Research in Dementia Precox founded by the Supreme Council, 33° Scottish Rite, Northern Masonic Jurisdiction, U. S. A.

Proceedings of the Sections

SECTION ON GENERAL MEDICINE

Regular Meeting, April 25, 1938

Diabetes Insipidus as a Symptom of Metastatic Carcinoma. Mitchell Bernstein, M.D.,* Matthew T. Moore, M.D.,* and David B. Fishback, M.D.* (*Abstracted below.*)

Abnormal Uterine Bleeding as a Symptom in Typhoid Fever. Charles P. Wofford, M.D.,* Duncan G. Calder, M.D.,* and Ferdinand Fetter, M.D. (*Abstracted below.*)

The Failure of Sodium Succinate to Influence Diabetic Acidosis. A. W. Terrell, Jr., M.D.* and F. D. W. Lukens, M.D. (*Abstracted below.*)

Embolic Phenomena in Subacute Endocarditis. Josephus T. Ullom, M.D. (*Abstracted below.*)

Abstracts

Diabetes Insipidus as a Symptom of Metastatic Carcinoma. Mitchell Bernstein, M.D., Matthew T. Moore, M.D., and David B. Fishback, M.D.

Diabetes insipidus as a clinical manifestation has long been a subject of interest and controversy. Staemmler, in 1932, indicated that isolated lesions involving the posterior and intermediate lobes of the pituitary body or the hypothalamus might lead to diabetes insipidus, while Roussy and Mosinger, and Leschke, in 1933, favored the hypothalamic origin. More recently Ranson and his co-workers stated that "The evidence from this investigation supports the theory that diabetes insipidus is a hormonal disturbance, caused by a deficiency in the secretion of the antidiuretic principle by the pituitary gland. The view is set forth that the supra-optico-hypophyseal system sends secretory impulses to these divisions of the hypophysis and that

* By invitation.

damage to this system at one of three points, the nucleus, the fiber tract and the pars intermedia and pars neuralis, results in diabetes insipidus."

Fink, Futcher, Grassman and others have reported cases in which diabetes insipidus occurred in metastatic lesions involving the hypothalamico-hypophyseal system.

Our patient, a man aged 64, presented the symptoms of diabetes insipidus as the only complaint. Neither the history, the physical examination nor the laboratory data gave any definitive clues as to the etiology of the disturbance in water metabolism.

Examination of the chest revealed an area of bronchovesicular breathing on the left side at the 7th interspace posteriorly. This was confirmed by roentgenographic findings, which, however, were interpreted as inflammatory and not malignant.

Death occurred following an attack of hemiplegia. The postmortem findings showed a primary bronchogenic carcinoma involving the left lung with metastasis to the serous membranes of the thoracic and abdominal organs, and to the brain, cerebellum, hypophysis and infundibulum, with sparing of the hypothalamus.

It is suggested that, in the absence of conclusive evidence as to the etiology in a patient with diabetes insipidus, masked malignancy be suspected and an effort made to establish the primary source.

Abnormal Uterine Bleeding as a Symptom in Typhoid Fever. Charles P. Wofford, M.D., Duncan G. Calder, M.D., and Ferdinand Fetter, M.D. (From the Medical Service of Truman G. Schnabel, M.D.)

Case histories of three patients who were admitted to the Philadelphia General Hospital within a relatively short period of time, each suffering with typhoid fever, were reported. Each of these patients showed irregularities of the menstrual cycle during her illness, the irregularity being different in each case. In one it took the form of prolonged, excessive metrorrhagia with the passage of numerous clots during the first and second weeks of her disease. In the second patient the symptoms were those of menorrhagia, together with a change in the character of the menstrual flow, which became foul-smelling, reddish-brown, and occasionally interspersed with clots. In the last case the menstrual cycle had been disrupted by an abortion five months previously, but her typhoid fever was ushered in by unusually profuse uterine bleeding.

The literature has brief mention of this symptom and, then, in only a few of the older textbooks. The importance of the symptom lies in the possibility of its confusing the diagnosis, as shown in the first case history. This error might be avoided in similar instances, if the possibility of menorrhagia and metrorrhagia in typhoid fever is kept in mind. It is our opinion that abnormal uterine bleeding in typhoid fever is encountered more frequently than the brief mention in the literature would indicate.

The Failure of Sodium Succinate to Influence Diabetic Acidosis. A. W. Terrell, Jr., M.D. and F. D. W. Lukens, M.D.

The original report of Koranyi and St. Györgyi (1937), that succinic acid controlled diabetic acidosis in 5 cases, has not been confirmed. The present study includes 6 cases in which the results agree with the reports of those who have been unable to observe any effect of succinic acid or its salts in diabetes. Sodium fumarate, hitherto untried, was likewise ineffective. The influence of sodium succinate on the experimental ketonuria of rats, produced by injections of pituitary extract, was less than the effect of similar doses of glucose. The clinical cases illustrate the precautions necessary in appraising the disappearance of ketonuria.

Embolic Phenomena in Subacute Endocarditis. Josephus T. Ullom, M.D.

Subacute endocarditis is almost uniformly engrafted upon an antecedent rheumatic lesion. The vegetations occur on the valves already deformed by the disease. They are large, soft, and made up of blood platelets, leukocytes, fibrin and bacteria. They are easily washed off by the blood stream and carried to various parts of the body. Emboli are most frequently found in brain, spleen and kidney. Emboli to the brain, besides producing hemiplegia, oftentimes produce symptoms of meningeal irritation; notably, stiff neck, photophobia, and an increased cell count, sometimes as high as 2,400 cells. The pathology of this is not definitely understood. According to some writers, it is due to the rupture of small aneurysms on the basilar artery. Other embolic phenomena, such as Osler's nodes, are found in about fifty per cent of cases. According to some authors, these are probably uniformly present but are not discovered, due to ignorance or to neglect in looking for them. A series of fourteen cases is reported in which over fifty per cent showed emboli. Difficulties in diagnosis are emphasized, and the importance of evaluating the various factors in the history and physical examination.

Regular Meeting, May 23, 1938

Pulmonary Tuberculosis and Heart Disease in Anthracosilicosis. Robert Charr, M.D.,* Archibald C. Cohen, M.D.,* and Otto L. Bettag, M.D.* (*Abstracted below.*)

Congenital Clubbing of the Fingers and Toes. Edward Weiss, M.D. and Morris Kleinbart, M.D.* (*Abstracted below.*)

The Value of the Leukopenic Index in Determining Food Allergy. Harold W. Jones, M.D. (*Abstracted below.*)

Alterations in Metabolism on the Effectiveness of Insulin. Graham W. Hayward* and Garfield G. Duncan, M.D.

Abstracts

Pulmonary Tuberculosis and Heart Disease in Anthracosilicosis. Robert Charr, M.D., Archibald C. Cohen, M.D., and Otto L. Bettag, M.D. (From White Haven Sanatorium, White Haven, Pa.)

During the past fifteen years, at ten hospitals in Luzerne County, 541 anthracite coal miners and 730 white male adults came to necropsy.

* By invitation.

Among the 541 miners 115, or 21.3 per cent, died of pulmonary tuberculosis, and an additional 37 cases, or 6.8 per cent, showed pulmonary tuberculosis which was not the cause of death. Altogether, 152 cases, or 28.1 per cent, had pulmonary tuberculosis.

Among the 730 non-miners 65 cases, or 8.9 per cent, died of pulmonary tuberculosis, and an additional 11, or 1.5 per cent, showed pulmonary tuberculosis which was not the cause of death. Altogether, 76 cases, or 10.4 per cent, had pulmonary tuberculosis.

Contrary to its general incidence, in anthracosilicosis tuberculosis is more common in the aged than in the young. More than 75 per cent of the tuberculous miners in the present study were over forty years of age.

A definite relationship exists between the type of tuberculosis and the extent of anthracosilicosis. The greater the amount of anthracosilicosis in the lung the more likely it is to be accompanied by tuberculosis, though the more likely this tuberculosis will be of a chronic type. The smaller the amount of anthracosilicosis the less likely it is to be accompanied by tuberculosis, though this tuberculosis is more likely to be acute.

In regard to heart disease, out of 541 miners 126, or 23.3 per cent, died of some form of heart disease. The most common form was chronic myocardial degeneration with hypertrophy and dilatation of the right ventricle and auricle. Coronary artery disease, aortic aneurysm, and angina pectoris were less common. Of the 730 non-miners 99 cases, or 13.3 per cent, died of heart disease.

Congenital Clubbing of the Fingers and Toes. Edward Weiss, M.D. and Morris Kleinbart, M.D.

Two unrelated cases of congenital clubbing of the fingers and toes are reported. In both cases there was no evidence of past or present heart or lung or other chronic disease and the condition had existed as long as the patients could remember. In one case X-ray studies of the fingers did not show any bony changes.

The literature of the subject has recently been reviewed by J. T. Witherspoon in *Arch. Int. Med.*, Jan. 1936, **57**, 18, and this material was referred to in the presentation. Witherspoon had collected fourteen cases in addition to the case of a negro which he reported. He stated that this was the first instance of simple familial and congenital clubbing of the fingers and toes in a negro to be described in medical literature. One of the cases that we present also occurs in a negro.

THE VALUE OF THE LEUKOPENIC INDEX IN DETERMINING FOOD ALLERGY. Harold W. Jones, M.D.

From a clinical standpoint, many individuals seem to be allergic to various foods. The dietary and skin tests have not proved satisfactory indicators of this state. Vaughan suggested the leukopenic index. Without food two white blood cell counts are made in the morning at ten minute intervals. The mean is estimated. Food is given and three counts, at half hour intervals, are made. A drop of 1000 or more from the mean, Vaughan states, signifies a positive reaction. Other observers state that a drop of 500 can be considered significant.

This study is made to determine whether so small a change can be considered significant. Two expert technicians made more than 3000 white cell counts on ten non-allergic medical students. There were two control periods without food, and one with egg, one with wheat and one with milk. Special attention was paid to pipette shaking and to distribution in the counting chamber. The curves were constructed on the basis of the counting of between 800 and 1200 cells in each interval. Two counts were made every twenty minutes by each technician for two and a half hours, beginning at nine in the morning.

The variations without food were as great as, or greater than, when food was taken. Nine of the ten students, when no food was taken, showed a variation that, according to Vaughan's standards, would indicate allergy. Our studies seem to suggest that the standards set forth by Vaughan can not be taken as indicative of food allergy.

I suggest that the test, to be of value, should be made with the patient at rest, at least 800 white cells should be counted, pipette shaking should be done with a double shaking movement for four minutes, and a drop of 3000 should be obtained before the result be regarded as significant.

SECTION ON OPHTHALMOLOGY†

Regular Meeting, April 21, 1938

OCULAR MUSCLE PALSIES IN A CASE OF TOXIC GOITRE: SUPPLEMENTARY REPORT AND EXHIBITION OF CASE. C. E. G. Shannon, M.D.

A CATARACT SECTION REDUCING THE INCIDENCE OF IRIS PROLAPSE. Frank C. Parker, M.D.*

THE CLINICAL SIGNIFICANCE OF THE RETINITIS OF LEUKEMIA. Glen G. Gibson, M.D.*

EXTERNAL ORBITOTOMY demonstrated by a moving picture. Edmund B. Spaeth, M.D.

SECTION ON OTOLARYNGOLOGY‡

Regular Meeting, April 20, 1938

FOCAL INFECTION AND ITS RELATIONSHIP TO SYSTEMIC DISEASE. Thomas Klein, M.D.

SECTION ON PUBLIC HEALTH, PREVENTIVE AND INDUSTRIAL MEDICINE

May 13, 1938

(*Annual Students' Meeting*)

GROUP HOSPITALIZATION IN THE UNITED STATES. Sylvia A. Mazer* (Prize Winner), *Woman's Medical College.*

THE PHILADELPHIA COUNTY MEDICAL SOCIETY'S PLAN FOR GROUP HOSPITALIZATION. Wm. Egbert Robertson, M.D., *President of the Philadelphia County Medical Society.*

† The proceedings of the Section on Ophthalmology are abstracted in the *American Journal of Ophthalmology* and the *Archives of Ophthalmology.*

* *By invitation.*

‡ The proceedings of the Section on Otolaryngology are abstracted in the *Archives of Otolaryngology.*

The Early Years of the Obstetrical Society of Philadelphia*

By Lewis C. Scheffey, M.D.

Clinical Professor of Gynecology, Jefferson Medical College
Fellow of the College of Physicians of Philadelphia

(*Part I*)

Within a few weeks this Society will be seventy years old, and since it is the prerogative of age to reminisce, let us return for a while to earlier days.

Times were troubled in America in the spring of 1868. President Andrew Johnson, on trial before the Senate of the United States sitting as a Court of Impeachment, was to be acquitted of "high crimes and misdemeanors" through the intrepid courage of seven high-minded men who on May 26th replied "not guilty" to Chief Justice Chase's interrogation. Though they were hounded from public life by the subsequent bitter enmity of the radical opposition, these seven men by their bravery had prevented a foul blot upon the escutcheon of a valiant but misjudged Chief Executive.

Congress returned to its task as a legislative body; the readmission of the Carolinas, Louisiana, Georgia and Alabama to the Union was being exhaustively debated; Senator Sherman called up for passage the bill to enforce gold contracts, while alarm was voiced over a national debt which had risen to two and a half billion dollars, and a bill to tax previously exempt government securities was tabled on motion of ailing Thaddeus Stevens.

The heroic Grant had just been declared the presidential nominee by the Republican Convention in Chicago, after much waving of the bloody shirt, while the reunited Democrats, eight years removed from Charleston, were gathering at Tammany Hall, to finally compromise on Horatio Seymour, ex-Governor of New

*Address of the retiring president, delivered before the Society, May 5, 1938.

York, as their standard bearer, after twenty-one long drawn out ballots. Labor unrest was widespread. Upholsterers in New York, for instance, were actually objecting to working from six o'clock in the morning until ten at night to earn a weekly sum of twenty dollars, and painters in Indianapolis were striking for a wage rate of three dollars a day.

The old world, too, was disturbed. The American fleet under Admiral Farragut, on a courtesy cruise to European waters, lay at anchor in the harbor of Brest, while in Paris the rather familiar theme of increasing armament to prevent war was voiced by Rouher before the Corps Législatif. Napoleon III, recoiling from the tragedy of his Mexican adventure, was soon to face Sedan and oblivion, for while his cousin Prince Napoleon, Jerome's son, had access to Francis Joseph's ear in the Hofburg, Bismarck and his Emperor, assiduously welding the bonds of the North German Confederation, were confident of Austrian neutrality in the days to come.

Bells chimed joyously and cannon boomed in far-off St. Petersburg when a son was born to the Grand Duke Alexander, the Czar's heir-apparent—that same son who fifty years later, with his captive family huddled about him, was to face a firing squad in a dismal Siberian cellar. Captive Englishmen, rescued by General Napier and his native allies from the custody of Theodorus in Abyssinia, were on their way to Suez and home. Cambridge was honoring Longfellow, while Dickens toured America.

But let us return to Philadelphia. The city was surely expanding, for nearly one hundred and fifty houses were being erected between Chestnut Street and Darby Road, and as far west as Thirty-second Street—and Darby Road was to be paved! Arrangements were being made by the Honorable Richard Vaux for the laying of the corner-stone of a magnificent Masonic Temple at Broad and Filbert Streets on St. John's Day following.

Mayor Morton McMichael was having his annoyances, too, for Chief Justice Thompson of the State Supreme Court had just filed an opinion and granted injunctions restraining His Honor and the City of Philadelphia from taking possession of the Gas Works, control of which was to remain with the trustees. The

National Board of Trade, meeting in the Academy of Music, adjourned after adopting resolutions favoring national improvements, additional aid to the Kansas Pacific Railroad, and a reduction of the tax on whiskey. At Mrs. John Drew's Arch Street Theatre, Lewis Baker was playing in Augustin Daly's great play, "Under the Gaslight," which dramatically depicted, among other acts, "Delmonico's at seven," and "A train of cars at full speed."

"The stock market"—and I quote from the *Public Ledger* of June 8, 1868—"was irregular yesterday with a tendency to lower prices. This depression, so far as Government loans are concerned, is not surprising when we remember how largely and steadily they have advanced for the last two or three weeks." Reading Railroad 6's were quoted at 102¼; Schuylkill Navigation common at 10½, with the bonds at 86, while United States 6's of '81 were listed by Drexel & Co. at 116½.

In the advertising columns, the celebrated Indian doctor, R. G. Spencer, announced the removal of his office to 128 Coates St., adding modestly, "I can cure all diseases, cancers and fits."

This, then, was the background of our natal year, when certain zealous members of the medical profession in Philadelphia decided that the time was ripe for the organization of a group of medical practitioners who were particularly interested in obstetrics and the diseases of women and children. Let us glimpse them more intimately, as certain ones gathered together on Saturday evening, June 6th, 1868, in response to his call, at the office of Dr. Albert Holmes Smith at 113 South Broad Street, where the Real Estate Trust Building now stands. Present were Doctor George Pepper, who with Doctor A. H. Smith initiated the plans, and Doctors Francis Gurney Smith, Jr., Ellwood Wilson, Lewis D. Harlow, Thomas G. Morton, Robert P. Harris, D. Murray Cheston, James F. Wilson, and William Goodell. A committee was appointed to draw up a constitution and to frame a set of by-laws. Two weeks later, on June 19, a second meeting was held at Dr. Smith's office, and 28 names appear on the rolls as members of the Society which was formally organized that night. In addition to those already mentioned we find noted: Doctors William R. Dunton, William Byrd Page, William V. Keating, John H. Packard, J. Forsythe Meigs, Joshua G. Allen, William Hunt, James H. Hutchinson, Edwin Scholfield, James Tyson, William H. H. Githens, Charles H. Thomas, Ellerslie Wallace, Edward L. Duer, Horace Williams, D. Hayes Agnew and George C. Harlan.

Article II of the original constitution reads as follows: "The object of the Society shall be to advance the study of obstetrics and the diseases of women and children by the presentation of specimens and the free discussion of subjects of interest properly belonging to these several branches of medical science."

These objectives were reiterated in the application for a charter as a corporation presented on March 26, 1877, approved by the proper authorities on April 14, 1877, and registered as such on April 27, 1877, during the presidency of John H. Packard. That publication of their proceedings was soon desired is evidenced from the following announcement which appeared in the *American Journal of Obstetrics*, Vol. 2, No. 2, published in August, 1869: "The Philadelphia Obstetrical Society having voted preference to this journal for the publication of its transactions, we have commenced and will continue to present to our readers all essays read before the Society as well as the proceedings of its special meetings."

Some of these founder members, as time went on, became more or less active in other channels, but it was from the ideas and ideals of this representative group of Philadelphia doctors that this Society sprang, seventy years ago. From the time of its inception, the meetings were held in the former building of the College of Physicians at 13th and Locust Streets. The last meeting held there was on Nov. 4, 1909, and the first meeting in this very building [that of the College of Physicians], on Dec. 2, 1909.

Francis Gurney Smith, Jr., Professor of the Institutes of Medicine at the University of Pennsylvania, was chosen to be the first president. He had been graduated in medicine in 1840, and following residencies at the Pennsylvania and Wills Hospitals became specially engaged in the practice of obstetrics and diseases of women. Within a decade, however, it seems that he became more interested in medical journalism and physiology, for we note that in addition to the co-authorship of several textbooks he was an editor of the *Philadelphia Medical Examiner* and also published a report of his experiments on digestion, as performed on Alexis St. Martin in 1856. He was active clinically, being an attending physician to the Pennsylvania, Episcopal, and St. Joseph's Hospitals. While Francis Gurney Smith's advent into medicine was along the lines of our specialty, it is apparent that his career diverged rather sharply from it and his chief claim to our consideration is the fact that he was the first president, serving until 1871, selected perhaps because of his pre-eminent position in Philadelphia medicine at that time. It is astonishing to note that his father and five uncles lived to be octogenarians, and that all celebrated their golden weddings. A son, Robert Meade Smith, practiced medicine in Philadelphia, and was a member of this Society from 1876 to 1881.

George Pepper, the first secretary of the Society, was a marvelous person. He was referred to by his fellow members as their most active associate and staunchest supporter. The son of Professor William Pepper (primus), who was also his preceptor in the study of medicine, he took part in the Civil War at the age of 21, serving with the Sixth Pennsylvania Cavalry, known as "Rush's Lancers," first as a private, later being promoted to a lieutenancy. He was injured under fire at Fredericksburg and was honorably discharged from the service. After graduating in medicine in 1865, he took charge of a district for the Philadelphia Dispensary, and became the assistant of J. Forsythe Meigs at the Pennsylvania Hospital. He wrote carefully and gave well-planned instruction on the diseases of women to large private classes at the old Lying-In Hospital, then familiarly called the "Nurses' Home," and also at the Jane Street Medical Institute. Appointed accoucheur to the Philadelphia Hospital, his health failed soon afterward and he fell a victim to tuberculosis at the early age of 31, while still secretary of the Society. He was a corresponding member of the Boston Obstetrical Society. James Tyson said of him that, "Had it not been for his untimely death, he would have become as famous in obstetrics and gynecology as his brother William was in other lines, for he presented the same remarkable executive and mental abilities and the same tireless energy that is called genius." William Goodell referred to "His great artistic talent, his mechanical ingenuity, his singularly retentive memory, his industry and enthusiasm in the pursuit of knowledge [all of which] gave promise of the highest attainments." George Wharton Pepper is his distinguished son. We are rightfully impressed when we consider the accomplishments of his relatively short medical life.

Robert P. Harris was the second president of the Society, elected in 1871. He practiced medicine in Philadelphia for 35 years, was neither a clinical obstetrician nor a gynecologic operator, but, according to Howard Kelly, the most prominent medical statistician in these subjects that this country has ever seen. Lawson Tait once called him a "library surgeon." He was in truth a prolific writer and his many compilations make fascinating reading. He edited Playfair's "Midwifery." On Dec. 3, 1868, he read the first paper, later reported as part of the first published transactions, one entitled, "Hereditary Convulsions of Infancy and Childhood." In 1871 he presented a summary of all the published Caesarean operations performed in the United States up to that time—60 in all. Twenty-eight were fatal to the mother, while 27 children were saved. Incidentally, 3 had been performed in Philadelphia, and 2 in New York—these cities collectively containing at the time more than 2,000,000 inhabitants! Years later he collected instances of cow-horn injuries to pregnant women that had resulted in the delivery of living children, with proportionately more survivals than occurred with the Caesarean operation of that day, his comment being, "a better showing for the cow-horn than the knife." At a subsequent meeting he exhibited 17 different kinds of forceps then in use, and on another occasion spoke of the evil effects of sewing machines, especially the French variety, which had a double treadle and were a factor in developing eroticism in those using them. He was a bachelor, but shared an office with a woman physician. Dr. Longaker tells me that Dr. Harris was one of his sponsors when he became a member of this Society.

He died in 1897 at the age of 75, following the second of two paralytic strokes.

William Goodell was president in 1872 and again in 1873. Son of a missionary in the Far East, he was born on the island of Malta, and spent the early days of his life in Constantinople. After his graduation from Jefferson Medical College, in 1854, he returned to Turkey for a while. Certain of his later writings and discussions were colored by the impressions he had received there. He came back to America, and when the Preston Retreat was finally opened for occupancy in 1865 became its director, a position he held until 1887. This incorporated charity had been established in 1836 by the will of Dr. Jonas Preston, who bequeathed $250,000 for its establishment; the story of the accumulation of this fortune is a tale in itself. The investment shrank because of the marked decline in value of the shares of the Schuylkill Navigation Co. due to the rising competition of the railroads, and this delayed the completion and occupancy of the institution for nearly 30 years. Some time later (in 1874) Goodell became Clinical Professor of Diseases of Women and Children at the University of Pennsylvania, where he remained until 1893. Among his associates at the University were Leidy, Agnew, Ashurst and R. A. F. Penrose, the latter, incidentally, not a member of the Obstetrical Society.

In 1869 the meetings continued throughout the summer months and we note that at a meeting in November of that year William Goodell showed a galvanic bougie composed of two metals so arranged that when the handles were approximated a galvanic current was established. This had been used empirically to produce an illegal abortion. It was presented in court and had been given to him at the trial. Goodell wondered at the time whether it would be of advantage in the treatment of certain diseases of the uterus and vagina. He once discussed maternal impressions as a cause of birthmarks. He mentioned the case of a husband who had assisted at a Hebrew circumcision, which experience the man related to his pregnant wife. When she was delivered of her child, the infant exhibited a retracted prepuce with a granulating cicatrix which looked exactly like a circumcision. Some years later Goodell told of performing an ovariotomy at the University Hospital under carbolic spray precautions. The pedicle was dropped. However, septicemia developed on the third day. Two stitches were removed from the lower part of the wound and the cavity washed out, but death followed. Goodell announced: "I will not again operate in a hospital." In discussion, one Dr. Ludlow considered that all antiseptics were poisonous and suggested boiled water instead, but Goodell replied: "No; the next time I will use a solution of chlorinated soda." A Dr. O'Hara inquired what the source of danger was in the hospitals and Goodell replied that the poison was so subtle that a single patient or a student from the dissecting room passing through was sufficient to impregnate the whole room. During the same discussion Ellwood Wilson and A. H. Smith locked horns regarding the advisability of intraperitoneal injections of potassium permanganate solution in a postoperative case which had terminated fatally.

The minutes of the October meeting of 1882, reporting Goodell's discussion of Parrish's diagnosis from endometrial secretions (one malignant), say that "he [Goodell] did not allow the revelation of the microscope to govern him in his treatment of bleeding uteri. He had under his care recently three such cases, all of which were reported by the microscopist to be carcinomatous, but one of these cases was entirely cured by local measures." He also cited two other cases "of lacerated cervices with ectropion and free hemorrhage, pronounced undoubted cancer by a microscopist of high repute, relieved by scraping and cured by operation." He spoke of a type of case occurring among stout or plethoric women, saying that hemorrhage will recur after any treatment, but that temporary benefit can be obtained by curettment. Minute granulations being present, the curet exercises a tonic effect, and contraction results, checking the menorrhagia.

Goodell was an able clinican, a wise diagnostician, and a skilled operator, who graduated from his particular field of plastic surgery and ovariotomy when antisepsis and asepsis brought pelvic surgery to the fore. His earlier work was more essentially of an obstetric nature, and here too he was an earnest disciple of Garrigue's in combating puerperal sepsis, evidenced by many years of successive deliveries at the Preston Retreat without a septic death. A founder of the American Gynecologic Society, he was a prolific contributor to medical literature, meticulous in composition and clear in expression. Faithfully attentive to the affairs of the Society, he was a member of the Council at the time of his death, on October 27, 1894, at the age of 65. It is of interest to note that a few months before his death, his Alma Mater, Jefferson, had conferred upon him the honorary degree of LL.D. His son, W. Constantin Goodell, was also a member of this Society, from 1888 until his death in 1918. The Goodell fortune was responsible for the establishment of the William Goodell Professorship of Gynecology at the University of Pennsylvania. The first incumbent, in 1922, was our late fellow-member John G. Clark, and he was succeeded, upon his untimely death in 1927, by our esteemed colleague, Floyd E. Keene, who so graciously occupies the chair today.

Albert Holmes Smith has been acclaimed by many as the real founder of the Obstetrical Society, for as has been stated, it was at his home the the initial organization meetings were held. He was president in 1874 and again in 1875. Following graduation he had, within a short time, become attending physician and lecturer at the Lying-In Charity Hospital, and while he was not an eloquent speaker, his knowledge, sincerity and practical ideas brought him a large following. He was a most skillful obstetrician—it has even been said that he was the leading one of his time in America. He became well versed in gynecologic surgery. His literary contributions were of a practical nature, some descriptive of appliances he had devised, such as, notably, the pessary that bears his name. Possibly his Quaker ancestry was responsible for his valiant championship of equal rights for women in medicine. He was consultant to the Woman's Hospital. This association and his struggle on behalf of the entrance of women physicians into medical societies cost him many friends and involved him in many a bitter argument. First, in 1867, a resolution aimed at him was offered in the College of Physicians, but without success, making it an offense punishable by expulsion for Fellows to consult with women physicians. On Nov. 6, 1879, he crossed swords with Goodell and other members of this Society in a famous controversy regarding the participation of women physicians in the meetings.

The By-Laws of the Society were such that if a presentation were made for a non-member, the latter could appear as an invited guest but could not take part in the discussion. I quote from the minutes of that date:[1]

Dr. A. H. Smith, in accordance with a notice given by him at the last meeting, offered the following resolution: 'Moved, that when any physician in regular standing shall announce for presentation to a meeting of the Society, through a member, a specimen for exhibition or a paper to be read connected with the objects of the Society, said physician shall be considered the guest of the Society at such meeting and may be invited by the President to enter into the discussion to which such presentation may give rise.'

The motion was seconded by Dr. Ellwood Wilson. Dr. Smith remarked that in introducing this motion he did not do so with the idea of it being necessary to have permission to bring women who were practitioners of medicine of good standing and character in the profession to stated meetings, as the right to do so is given by Section 3 of Article 5 of the By-Laws. But he did not wish to bring to a meeting of this Society any person whose presence would be disagreeable to a majority of the members. This motion was introduced to obtain an authoritative expression of opinion on this point.

"We have accepted papers from women physicians, they have been announced on the notices of the meetings, the thanks of the Society have been by special motion tendered to the writers. They have been accepted by the Publication Committee and have appeared in our Transactions. No one has questioned the propriety of these actions. Have we the right to ask for papers or to accept them from those whom we refuse to admit even as guests to our meetings? An honest expression of opinion is wished for. No amendment to the By-Laws is intended."

Dr. William T. Taylor thought it had been decided some time ago that we did not wish women members of the Society. This motion would be a stepping stone and soon after we had women visitors we would have women members. He did not agree with Dr. Smith as to the right to introduce women being conferred by the By-Laws, as the pronoun 'he' was used a number of times in them and until a 'she' could become a 'he' the women were excluded by the By-Laws as they stand.

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[1] Where the speaker has evidently been quoted verbatim we have inserted the punctuation marks omitted in the original. [Editor's Note.]

Dr. Goodell did not wish to be a dog in the manger. He had an affection for this Society. It was the first medical society to which he had belonged, before which he had read his first paper, and he had done much work for it. He thinks the introduction of women to the meetings of the Society will be harmful, but he does not demand the constitutional majority in favor of the question, which would be necessary if it were considered an amendment to the By-Laws. If a simple majority only of the members present this evening are against the admission of women to the meetings as visitors, he will yield. But he thinks it will do harm and is part of a scheme to secure their recognition by the Society. This matter was discussed in the Publication Committee when the paper by Mrs. Cleveland was brought before it. He opposed its acceptance at that time, but the committee were divided in their opinion and the paper was passed. "My education, association, and feelings would make it painful for me to meet women in this Society."

Dr. Ingham remarked that if the motion of Dr. Smith had been put forward as an amendment to the By-Laws, he would have voted against it as being unnecessary, there being nothing to prevent the presence of women as visitors and only the impossibility of obtaining the necessary four-fifths vote prevents them from becoming members. As an expression of opinion, he would take pleasure in voting for it. Women had already obtained admission to a number of medical societies and were valued members. Science should take no recognition of sex or color.

Dr. Parrish thought this motion an infringement of one of the By-Laws as it takes no notice of the number of times a visitor may be present in a year, the By-Laws limiting the number to three.

Dr. Smith had made no attempt to gain favor for his motion; he had not canvassed for votes. Dr. Taylor was mistaken in his opinion about the value of the language of the By-Laws. Legal opinions on the subject had been obtained a year ago from Messrs. George M. Dallas and Alexander D. Campbell in consequence of this knowledge of the admissibility of women to membership, if the necessary four-fifths vote could be obtained. Dr. Nebinger introduced his amendment to insert the word 'male' into the By-Laws. This amendment did not receive the votes of a majority of the members present on that occasion.

"Dr. Goodell mistakes when he says that I said the Society asked for contributions from the Woman's Hospital. *I* have asked for specimens, *I* have asked for papers. The papers and specimens have been of interest and have been well received. Medical journals of the highest class have asked for contributions from the women. In the number of gynecological hospitals the Woman's Hospital is second only to the New York State Hospital and its dispensary service is unequaled in this country. I will not ask for another specimen or paper from a woman if the action upon this motion is adverse. I do not know of any woman who has expressed a desire for membership in this Society. Mrs. Cleveland allowed her name to be used as a test case. We should consider the stand taken upon this question by the medical world. Prominent men are changing their views on this subject in favor of the influence of women. Why should Dr. Goodell be afraid to talk before women? They have been present at every meeting of the Gynecologic Society. Was he embarrassed by their presence there? Are we a set of boys to be embarrassed by the presence of ladies? We can talk before nurses; is the effect of the presence of an educated woman worse than that of a nurse?"

Dr. Prall asked if women ever operate at the Woman's Hospital in a case of ovariotomy and other capital operations. Dr. Smith replied that all operative cases were performed by the staff of the hospital. Consulting physicians cannot operate at the hospital except upon private pay patients whom they may bring there for the advantage of nursing, etc.

Dr. Barr believed this resolution will act as an entering wedge to the membership of women and he would vote for it. He could not understand why there should be objection to the introduction of women of capacity.

Dr. Bernardy called for an immediate vote which on motion of Dr. Goodell was taken by ballot, resulting in 9 votes in favor to 18 against it.

Again, in 1882, Smith clashed with the "aggressively conservative" Horace G. Evans, President of the Philadelphia County Medical Society, on the same question. Under the trying circumstances of these debates, which offered him much provocation, it is said that "no discourteous word in reply ever crossed his lips. His gentleness was constant and unvarying and extended alike to all." His professional success was envied by some. Stricken with a fatal illness, which eventually proved to be a destructive adenoma of the prostate gland, he prepared what proved to be his last literary effort, undeterred by intense suffering. This was his presidential address before the 1884 meeting of the American Gynecologic Society and it dealt with the celebrated discussion on the nature of puerperal fever that had been entered into before the Academy of Medicine in New York by Fordyce Barker and Gaillard Thomas (both corresponding members of this Society). To quote a reviewer, "it was replete with evidence of research and imbued with the spirit of fairness and love of truth characteristic of its author." His death at the age of 50 deprived our profession of an able leader and a courageous soul when opportunity was beckoning him on to greater achievements.

John H. Packard was an Acting Assistant Surgeon in the Civil War, and was invalided after contracting typhoid fever in the heat and fury of Gettysburg. He was twice chosen president of this Society, in 1877 and in 1878, and was vice-president of the College of Physicians from 1885 to 1888. His career in obstetrics was soon overshadowed by his surgical propensities, and he resigned in 1888. I am privileged to retell an amusing anecdote from John H. Gibbon's memoir of him. Gibbon says that he had a keen sense of humor and was capable always of seeing the humorous and ridiculous side of a question. It cost him some friends. As a student he made a celebrated caricature of Dr. Hodge, then Professor of Obstetrics at the University of Pennsylvania. The latter came into his lecture room and saw on the blackboard a drawing which represented him as mounted across a uterus into the mouth of which had been inserted a bit and at the reins of which he was desperately tugging. Underneath was the legend, "Hodge on his hobby." It is interesting to note that in later years Packard became Professor Hodge's chief assistant.

Lewis D. Harlow, prior to a brilliant surgical career in the Civil War, at the conclusion of which he was mustered out as a lieutenant-colonel (brevet), was Professor of Obstetrics and Diseases of Women and Children in the old Philadelphia College of Medicine (1855–57), a position which he later held in the Medical Department of Pennsylvania College (1859–61). He was most active in the affairs of the Society, conscientious but unobtrusive, serving as president in 1879 and again in 1880. Dr. Harlow died in 1895 at the age of 77.

Edward L. Duer became president in 1882 and was re-elected in 1883. He, too, had a Civil War record. In addition to being accoucheur and clinical lecturer to the Philadelphia Hospital, where he inaugurated the first obstetrical clinic established in this city, he was a founder of, and attending gynecologist to, the Polyclinic Hospital. He was associated with Goodell in the latter's early days at the Preston Retreat. Duer was perhaps the most fashionable obstetrician in Philadelphia in those days, if the wealth and social importance of his clientele would designate him as such, for he succeded to much of the practice of R. A. F. Penrose, Ellwood Wilson and Ellerslie Wallace. Never a prolific writer, he was known as a clinician of skill and a practitioner of broad experience. His vitality and physical strength were remarkably retained when he was well on in years. Marrying at the age of 71, he retired to Odessa, Delaware, where he lived happily for a decade, his death occurring on September 6, 1916. He was made an honorary member of the Society in 1915.

William H. H. Githens was a pharmacist and a veteran of the Civil War prior to taking his degree in medicine. He was dignified but companionable and genial. Vitally interested in this Society, he served as secretary from 1876 to 1887 and upon his retirement from this office was presented with a "clock and mantel ornaments" by his fellow members, who later honored him with two successive terms as president, in 1891 and 1892. He resigned in 1895, and died on March 24, 1923, past 80 years of age.

Ellwood Wilson was the distinguished forbear of a medical dynasty. Two sons now deceased, James C. and Charles M., were members of this Society, while W. Reynolds Wilson remains with us as an honorary member. Immediately after his graduation, in 1845, from Jefferson Medical College, of which he was later elected a trustee, he became associated with Joseph Warrington at the Philadelphia Lying-In Charity, finally becoming President of the Board of Managers of that institution. He was likewise assistant to Charles D. Meigs, Professor of Obstetrics at Jefferson, and upon the latter's retirement succeeded to much of his obstetrical practice. He loved power and influence, had a fondness for the acquisition of property, and an amazing capacity for work. He was most regular in attendance at the meetings, his last appearance being in 1889, the year in which he died, at the age of 67.

During the summer of 1875 a remarkable controversy raged at the monthly meetings of the Obstetrical Society, continuing until December, 1875. It began with a paper presented by Ellwood Wilson, on May 6, 1875, entitled "Version in Contracted Pelves." This was an answer to Goodell's treatment by version of difficult labor in contracted pelves as related in a paper before the Society in February, 1875. Wilson quoted the dictum of the elder Hodge, namely, "The use of forceps as a means of delivery in difficult labors is a settled practice." In his argument against version, Wilson quoted Dewees, Meigs, Warrington, and others as well, and summarized thus: "Forceps are the best, most efficient, and the safest known means of delivering women whose pelves are contracted when the conjugate diameter is not less than 3″. In addition, he made some rather personal remarks against Goodell. The latter, at a meeting held on June 3, 1875, replied in great detail to Wilson's criticism, summing up in regard to the latter's final argument, viz., that "the versionists aim to bring to naught the promise that 'in sorrow thou shalt bring forth children'," as follows: "This curse and the corresponding one on man are not new arguments. A good deal of respect should be shown them on account of their age. From time immemorial they have been the stock arguments against all inventions and improvements in the arts and sciences. The one or the other has been advanced against steam, the loom, and all labor-saving machines; against the forceps, the use of ether in labor, and finally, in the wane of the 19th century, by my reviewer against version. So the 'versionists' as he contemptuously calls them, do 'aim to bring to naught the promise that "in sorrow thou shalt bring forth children".' All honor to the versionists then, say I, while I refer my critic to a careful perusal of the pious Simpson's reply to this time-worn and mediaeval argument:

"Obstetrics is not one of the exact sciences, and in our penury of truth we ought to be accurate in our statements, generous in our doubts, tolerant in our convictions. Without these qualities science cannot be promoted nor truth educed. Above all, as Milton has said, truth needs no policies, no stratagems, to make her victorious. Surely, then, arguments based upon misstatements and misquotation show a weak cause. But when in addition, the Book of Genesis is brought into a medical discussion, when the curse pronounced upon Eve is invoked as an argument, and when a grave and a vexed obstetrical question is settled by an appeal to Moses and the prophets, the cause must be a hopeless one."

In reply to the foregoing, Wilson came back at a later meeting, in September, exclaiming: "Now let us examine some of the arguments brought forward by the versionists by which they seek to turn aside and ignore all the natural powers and forces provided by the Creator for the relief of woman in her travail and aim, in vain, to bring to naught the promise that 'in sorrow thou shalt bring forth children.' " In conclusion, he criticized Goodell's "bold statement" that in nine cases out of ten of rupture into the rectum the forceps will be found to have been the cause, saying, "Are we to infer that this is the result of Dr. Goodell's personal experience? If it is, he has indeed been unfortunate with the forceps. Perhaps it is the result of observations at the bedside of those cases in which he has been called in consultation. Then the physicians who had managed the labors did not always use the forceps skillfully. If so, someone has blundered. After all, it is merely an opinion that Dr. Goodell has ventured. In science facts are better, or opinions derived from the observation of facts. In the absence of facts, I protest against such a sweeping condemnation of the profession or of the instrument which is much more judiciously and dexterously used by the profession than Dr. Goodell seems to suppose." At the October meeting, continuing the discussion, Wilson finally quoted Goodell as saying: "It is far better, in these emergencies, to kill in attempting to save life than to kill by cowardly inaction"—adding, "Shall any man take to himself the prerogative to kill? Hearken to the great Lawgiver who sayeth: 'Thou shalt not kill.' "

On December 2, 1875, Goodell made final rebuttal to this year-old debate, saying:

"I am beginning to think, with Newton, that 'a man must either resolve to put out nothing new' (I still venture to call my method new) 'or become a slave to defend it'. Finally, I have before referred to Dr. Wilson's respect for Moses and the prophets and his very reverent quoting of the Sixth Commandment; 'Thou shalt not kill.' Let me hasten to assure him that I also reverence the Decalogue and that remembering, moreover, the words of the Apostle that 'Whosoever shall keep the whole law and yet offend in one point, he is guilty of all', I strive while humbly trying to keep the Sixth Commandment, not to fail in observing the Ninth also."

William V. Keating was a member of the first staff of St. Joseph's Hospital, being appointed in 1844, the year of his graduation in medicine from the University of Pennsylvania. Well versed in obstetrics, he was elected in 1860 to succeed Charles

D. Meigs as Professor of Obstetrics and Diseases of Women and Children at Jefferson Medical College. Ill health prevented him from accepting the responsibilities entailed, but after returning from a European journey he worked actively in army hospitals during the Civil War and eventually resumed private practice. He edited Ramsbotham's "Midwifery" and Churchill's "Diseases of Women." In the latter years of his life he was Medical Director of three Roman Catholic hospitals in this city, St. Agnes', St. Mary's, and St. Joseph's, his death from heart disease dramatically occurring in the latter institution on April 18, 1894, while, at the age of 70, he was lecturing to a group of nurses. He was the father of *John M. Keating*, also a member of this Society (elected in 1875, resigned in 1881); the latter's death occurred a few months before his father's. Handicapped by ill-health, the son achieved prominence as an author and as a gynecologist in his short life of 41 years.

Ellerslie Wallace did not long remain a member of the Society, resigning in 1872. For twenty years he was Professor of Obstetrics at Jefferson Medical College, succeeding C. D. Meigs when Keating (W. V.) was unable to carry on in 1862. During the last four years of his professorship he also served as Dean of the College. Of strong physique, and adorned with magnificent whiskers, he was an earnest and positive teacher. The late E. E. Montgomery, who was a pupil of Wallace's, said of him in an address before the College of Physicians in 1925, illustrative of procedures 50 years before: "The professor of obstetrics was cleanly; he persistently urged careful washing of the hands before catheterizing a patient, but as the latter procedure and the introduction of the catheter were to be done without exposure of the genitalia, the purpose of the cleanliness might have been considered to have been defeated. In diseases of women, the examination of the genital tract was digital, without exposure, followed by the introduction of a tubular speculum, round the external end of which the enveloping sheet was carefully drawn. The next stage was the introduction of the sound. If not properly bent, he would do so with his teeth. When expressions of disgust were made by the students, he would impress them with the necessity of having the instruments so clean that they need not hesitate to put them in their mouths." Wallace died in 1885.

J. Forsythe Meigs retained his association with the Obstetrical Society for many years. The son of Professor Charles D. Meigs, he determined to be a surgeon. After completing a residency at the Pennsylvania Hospital, where later on he was staff physician for 23 years, he engaged in further study abroad. In 1843, while practicing in his father's house on Chestnut Street above Tenth, he gave a course in obstetrics with the Philadelphia Association for Medical Instruction, a group giving instruction supplementary to the regular series of lectures existing at the different medical schools. The Association remained in existence for eleven years. Gradually taking over his father's practice, he devoted more and more time to the care of children. In fact, when his first book, "Diseases of Children," appeared in 1858, a critic remarked: "Dr. Meigs has rushed in shirtless haste before the public." Revised later, in collaboration with William Pepper, it ran through seven editions over a period of 34 years. Otherwise he did not write extensively, but the memoir read by him before the College of Physicians on the death of his celebrated father is an unusual contribution of fact, sincerity and filial devotion. In the vacillating hours of Buchanan's last presidential days, Meigs' conscience was sorely tried. Although of New England ancestry, his father's family had spent their early years in Georgia. They were all Democrats and he was one by inheritance. Nevertheless, he turned to the Republican party, and his conversion to Lincoln's ideals was the result of thought and reading even to the day before election, when he talked long into the night with his lawyer friend, Horace Binney, relative to the historic and legal points at issue. Thereafter his devotion to the Union cause was paramount. It is definitely established that the plans for the organization of the Union League of Philadelphia were decided upon at a meeting held in his home on December 27, 1862, where members of the "Union Club" had gathered. It is said that at one time he considered melting down his household silver to aid the government. A product of stern discipline, he was a slave to duty, but while hoping for the leisure of retirement he carried on faithfully, almost to the day of his death, December 16, 1882, at the age of 64. When his death was announced at the next stated meeting of the Society, in January 1883, a motion to prepare a letter or series of resolutions to be sent to the family was rejected and a motion to spread upon the records the feelings of the Society was approved. Why the former motion was rejected I do not know.

James Tyson was assistant to Francis Gurney Smith, Jr. in 1867, and possibly it was this association that induced him to become one of the founders of this Society, of which he continued a member until 1882. His distinguished medical career culminated in his elevation to the Professorship of the Theory and Practice of Medicine at the University of Pennsylvania, where he succeeded the illustrious William Pepper (secundus), and to the Presidency of the College of Physicians in 1907. His death occurred in 1914.

Lewis Rodman, born in 1806, was a nephew of the distinguished John Ruan, who was one of the members of the committee appointed by the College of Physicians to elaborate plans for the creation of the Preston Retreat in accordance with the will of the benefactor. His preceptor was the celebrated physician Joseph Parrish. Later he became consulting physician to the Retreat and was a manager of the Philadelphia Dispensary. D. Hayes Agnew, who was President of the College of Physicians at the time of Rodman's death in 1890, at the age of 84 years, said of him: "He was a good, kind, sweet-tempered physician, a man without an enemy, a model of the old-fashioned family doctor." William G. Porter, a member of this Society, in presenting his memoir, philosophized as follows—and this, mind you, was nearly 50 years ago: "The advent of modern specialism, which requires a different physician for each case of illness in the family, has done away with all that, and the old-time family physician is rapidly becoming a memory of the past. Let us hope it is better for the patient; it is certainly better for the specialist."

D. Murray Cheston was particularly interested in the care of children, and within a year or so after obtaining his medical degree in 1864 became physician to the Children's Hospital, a position which he held for 20 years. He served as Treasurer of the Obstetrical Society from 1868 to 1881. A personal distinction that came to him was membership in the "Medical Club," or "Club of 19," formed in 1867 by George and William Pepper. He was eighth on the list of original members of this unique organization, which ended its existence in the early days of the present century. James Tyson, S. W. Gross, William Osler, Louis Starr and James C. Wilson were among those who graced its early membership. On April 11, 1911, a rather notable testimonial dinner was given in Cheston's honor. His death occurred in 1919.

Horace Williams was devoted to the interests of the Society for nearly 40 years, when ill health forced his retirement from active practice. He was consulting accoucheur to the old Maternity Hospital. He, too, was a member of the "19 Club," and was known as its "Dean" or Director. In 1906 he removed to Marengo, Iowa, and he was then made an associate member of the Society.

Charles H. Thomas, in addition to his activities as an obstetrician at the Lying-In Charity, was not only an ophthalmologist and surgeon to the Woman's Hospital, but Professor of Materia Medica and Therapeutics at the Woman's Medical College as well. He devised an ingenious set of intrauterine forceps, thin in structure like a sound, which eventually came into the possession of Dr. Daniel Longaker. At a meeting in May, 1874, he reported a case referred to him by one "doctoress" Estelle A. Benedict, then a student at the Woman's Medical College. The patient, an infant, showed an antenatal development of 9 teeth at the age of four weeks. The mother, while nursing, had stopped feeding it. "Whether or not an instinctive or superstitious shrinking from close contact with such a monstrosity contributed to this conduct is not certain, but it seems very probable," he said, stating that there was a superstition among nurses that a child that is born with teeth dies early, and he quoted from Shakespeare's "Richard III" the lines which Queen Margaret addresses to the Duchess of York:

From forth the kennel of thy womb hath crept
A hell-hound that doth hunt us all to death:
That dog, that had his teeth before his eyes.

James F. Wilson, Joshua G. Allen and Edwin Scholfield were associated with Albert H. Smith and Ellwood Wilson at the Lying-In Charity after Joseph Warrington's retirement in 1857. Allen was a Quaker, bald-headed, bearded and a bachelor. He instructed the "pupil physicians," as the young doctors in attendance at the "Nurses' Home" were called in those days. At an early meeting he told of a transfusion he had given to a woman who had miscarried. He introduced 4 ounces of defibrinated blood into a superficial vein of the woman through the medium of a simple glass syringe, and reported a satisfactory recovery. He died in 1903, when nearly 85 years of age. Scholfield, a much younger man, died when scarcely 40. I have been unable to find further reference to James F. Wilson, who apparently was not a relative of Ellwood Wilson.

William R. Dunton remained a member of the Society for 34 years, resigning in 1902. During the Civil War he was an Acting Assistant Surgeon in the United States Army. Known as one of the "three D's from Germantown," he, in company with James Darrach and R. N. Downs, controlled the major practice in that locality, in which he was both successful and fortunate. He was consulting physician to the Germantown Hospital. He removed to Montrose, Pa., where he died, on May 11, 1911, at the age of 80 years, so unobtrusively that his death was unknown to his former colleagues until a whole year had elapsed.

So much for those founders most prominent in the affairs of the Society; in addition, there were several whose activities in other fields of endeavor soon detached them from participation in its proceedings.

D. Hayes Agnew, Professor of Surgery in the University of Pennsylvania, and President of the College of Physicians in 1899, was described in 1868 as follows: "His hair was dark and beginning to turn white, as was his moustache, which was prolonged on the cheeks in military fashion. His height of more than six feet, and his fine muscular development made his figure commanding in spite of the slight professional stoop which he always had, the result of hours spent over sick beds and operating tables. His blue eyes were keen but kind in their expression. An old dress coat with brass buttons which he wore to the lectures gave him a military air." Dr. Agnew was called in consultation following the attempted assassination of President Garfield and was the only one of the surgeons in attendance who refused to render a bill for his services. He died in 1892.

Thomas G. Morton and *William Hunt* were surgeons to the Pennsylvania Hospital for 39 and 30 years respectively. To the former has been ascribed the first successful laparotomy for appendicitis with removal of the appendix, an operation performed on April 27, 1886. Prior to this he had seen his brother and, later, his son die from appendicitis, after vainly urging the attending surgeon to operate. Hunt died in 1896, Morton in 1903.

George C. Harlan, Surgeon to the 11th Pennsylvania Cavalry, an organization formerly known as "Harlan's Light Cavalry" and commanded by his uncle, Colonel Josiah Harlan, was captured in the campaign about Petersburg and confined in notorious Libby Prison. After the war, he became a most distinguished ophthalmologist. His death, on September 23, 1909, at the age of 64, was a tragic one, following an injury sustained when he fell from his horse while cantering along the banks of the Wissahickon.

James H. Hutchinson was a grandson of a founder of the College of Physicians, and he himself was its Vice-President at the time of his death in 1889. Primarily he had been interested in children's diseases, and at the time of his association with the founding of our Society he was attending physician to the Pennsylvania Hospital. It was at this period that the appearance of women medical students in the amphitheatre of that hospital created rather acrimonious dissension and threatened for a time to break up clinical teaching. It is said that "to Dr. Hutchinson's calm judgment and quiet but firm persistence in what seemed to him the right course, were due in no small measure the happy solution of the difficulties which had been encountered, and the turning away of the threatened danger."

William Byrd Page was the Professor of Surgery in the Pennsylvania Medical College and Surgeon to the Pennsylvania Institute for the Instruction of the Blind. He died not long after the organization of the Society.

From the organization year to the turn of the century, 150 active members were elected. To mention all individually, while not impossible, might prove fatiguing; but let us recall some of them, in sequence of their election.

(*To be concluded in the next issue*)

Notes on the Mütter American Giant

By Joseph McFarland, M.D.

Curator of the Mütter Museum of the College of Physicians of Philadelphia
Fellow of the College of Physicians of Philadelphia

Visitors to the Mütter Museum usually ask to be shown the relics of the Siamese Twins and the Giant, and beyond them, time and interest are soon exhausted, to the loss of the visitor and the regret of the management, for there are many other treasures, perhaps less spectacular but certainly more profitable.

The Siamese Twins are of world-wide fame, and have received so much mention in both the professional and lay presses that the name "Siamese Twins" has come to be applied to every kind of double monster. In the Index Catalogue of the Army Medical Library eight books are listed, giving every known detail of their births, life, adventures, personal and matrimonial, their financial success, their domestic unhappiness, their retirement in old age, their final illness, death, and post-mortem examination. In addition to these books, there are twenty-eight journal articles in five languages. Surely there is nothing left to be said about them.

But the Giant is unknown and mysterious. Suspended in the case, surrounded by other interesting skeletons, he bears the legend:

Skeleton of a Giant. Height 2.3 meters

> This skeleton is that of a young man from Kentucky probably 22 to 24 years old. His height would have been considerably augmented, were it not for a lateral curvature of the spine; this must have diminished the height at least 8 cm.

Beyond this meager information nothing can be learned from the custodian, from the curator or from the committee, as to the identity of the giant, his name, his fame, his date of birth or death or how he came to be there. The more one pores over the catalogues, the correspondence, and the minutes, the more mysterious he becomes, until it almost seems as though on some dark and quiet night he had sneaked into the museum to enjoy a macabre visit with the other skeletons, and failing to escape before sun-up, had hung himself in the case. Will he at some future time make as stealthy an exit?

Without documentary evidence of our rightful ownership, what would be the effect of an unexpected demand to deliver the giant to a claimant alleging that the Museum's only title to him is of that possession that is nine-tenths of the law, that such possession is the result of a *particeps criminis* and condemning the Museum as a receiver of stolen goods?

As the giant is said to have come from Kentucky, it has long been called the "Kentucky Giant," which has brought about a certain amount of confusion, for a few of the oldsters about the College may still remember that in their boyhood there was a "Kentucky Giant," a certain Captain Bates, who exhibited with the circus. Is it possible that ours is the skeleton of that well-known character? No.

The only important writing about our giant is the lengthy and detailed account contained in the Boylston Prize Essay for 1898, upon acromegaly, written by Guy Hinsdale, A.M., M.D., once a curator of the Mütter Museum.[1] In it we find these interesting paragraphs:

"In the year 1877, Prof. Joseph Leidy[2] was informed by Prof. A. E. Foote[3] that the body of a giant was offered for sale, provided no questions were asked

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[1] Hinsdale, Guy: Acromegaly. Detroit, Warren, 1898. [Reprinted from *Medicine*, 4, 1898.]

[2] Professor of Anatomy in the University of Pennsylvania and President of the Academy of Natural Sciences: born 1823, died 1891.

[3] Foote was a doctor of medicine who became professor of mineralogy or geology in the University of Michigan and amassed a large and valuable collection of minerals which he exhibited at the Centennial Exposition in Philadelphia in 1876. Finding that many visitors were anxious to purchase rare minerals, he opened a shop outside the exhibition grounds, where his large surplus of stock was sold. This turning out to be profitable, he never returned to the west, but continued the business in the central section of Phila-

which might lead to its identification. Arrangements were soon made by Dr. William Hunt,[4] through the gentleman mentioned above, and the body was transferred to Philadelphia, where the skeleton was prepared and mounted by Mr. R. H. Nash. . . . All the persons mentioned are now dead. They were never able to ascertain, or, at least, thought it prudent not to make inquiry as to the antecedents of this giant, whose skeleton, *the largest and most interesting in America* [my italics], now adorns the Mütter Museum of the College of Physicians of Philadelphia."

Hinsdale knew that the giant came from Kentucky, nothing more; but, perhaps remembering the "Kentucky Giant," Captain Bates, he calls our giant the "American Giant." Although the question is still sometimes asked, whether the skeleton is not that of Bates, it can certainly be answered in the negative.

Martin Van Buren Bates was born in Kentucky in 1845, and attained the height of seven feet, two and one half inches. He was a soldier in the Confederate Army during the Civil War, in which he rose to the rank of Captain. After the war he became an exhibitionist and traveled widely. In 1871, in the London church of St. Martin's-in-the-Fields, he was married to the Nova Scotia giantess, Anna Swann. One child resulted from this union, said to have been the largest baby ever born, measuring thirty-six inches in length and weighing twenty-one pounds. Shortly after, the mother died. Bates after some years married again, and at length retired to Guilford, Medina County, Ohio. He died in 1919. His widow asserts that there is no doubt about the burial. But it is not necessary to speculate further on the matter, for it is obvious that our giant, obtained in 1877, could not be that of a man who was living and exhibiting himself in public until a short time before his death, forty-two years after we came into possession of the skeleton.

Since he cannot be *the* "Kentucky Giant," it might be thought well if future references to our giant should follow Hinsdale's example and speak of him as the American Giant. But there are,

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delphia, where he sold minerals, retailing fine and rare specimens to collectors, and selling wholesale to chemical firms. He also dealt in rare books and occasional other objects of scientific interest. Through his business correspondence he was in a position to obtain information such as had to do with the giant.

[4] Dr. William Hunt was Chairman of the Museum Committee from 1877 to 1895.

and will be, numerous other American Giants, each of which may become confused with ours, unless some more definite

THE MÜTTER AMERICAN GIANT

A lateral view, showing the pigeon breast and the spinal curvature.

At the left, Dr. Charles D. Humberd; at the right, Dr. Joseph McFarland, whose height is five feet, seven and three quarters inches.

denomination can be given. To obviate any future difficulty of that kind, it is here suggested that henceforth he be known as The Mütter American Giant.

It seems unnecessary to discuss the pathological aspects of the case. Hinsdale covers that subject in his essay, and shows that there is an enlarged sella turcica that must have contained an enlarged hypophysis. The man had acromegaly, and also had the kyphoscoliosis, as well as the pigeon breast, that so often accompany it.

Most interesting is the question of his height. As the skeleton stands—or hangs—it measures seven feet, six inches. But that statement is not so simple as it at first appears, for some addition ought to be made to compensate for the loss resulting from the spinal curvature. To discover how much, use might be made of the method of the anthropologists, who have devised a system of computing the height of the body from the length of a femur. The method works perfectly upon normal skeletons. Our giant has not, however, a normal skeleton, but one in which the back is crooked, and in which, in consequence, one leg is a little longer than the other. Hinsdale (p. 71) attempted the correction of the height by this method and says of it:

"It is probable that the American Giant had attained the age of 22 or 24 at the time of his death. The bones seem to have attained their full development, although the epiphyseal junctions are plainly visible in all the long bones.

The spine has undergone a kyphoskoliosis which detracts considerably from the height which would otherwise exist. Taking the skeleton as we find it, the height is seven feet six inches. This measurement includes suitable artificial intervertebral disks, which were supplied in its preparation. There is a rule formulated by the late Sir George Humphrey by which we may consider the height of any individual, under normal circumstances, to stand in proportion to the length of the femur as 1000 to 275. But in our case, as in other abnormal skeletons, this rule may lead us astray; whatever the error may be in short skeletons or those of moderate height, in the case of giants the disproportionate length of the long bones, particularly those of the lower extremity, used as a basis of calculation, will lead us to a slightly exaggerated estimate of the total height. Applying this rule, however, to the American Giant, we have:

R 275:1000 :: 650:2363 = 7′ $8\frac{3}{4}$″
L 275:1000 :: 666:2421 = 7′ 11″."

So, there is some uncertainty as to exactly how tall our giant was. All that can be said is that he was probably something over seven feet, six inches, though probably less than the seven feet, eleven inches that results from the calculation based upon the length of the left femur.

It is a matter of some pride to those interested in this giant to believe him to have been a distinguished member of the giant fraternity. Was he sufficiently tall to merit distinction or was he only mediocre as giants go?

To answer this question the literature was painstakingly reviewed by Miss Janet Higgins, secretary-technician of the Museum, who collected data on more than a hundred giants whose heights seemed suitable for comparison. The idea was that, beginning with the tallest, they should be arranged in a regularly diminishing series until the Mütter American Giant found his place. When this was contemplated, nothing seemed simpler; but as it was attempted, unexpected difficulties and complications arose.

Through Hinsdale's remarks about the various results obtained from the different methods of measuring and computing the height of our giant it may be realized that the measurement of the height of any giant is subject to error. When a giant is measured by different men in different countries and at different times, different results are apt to be arrived at because of the different methods employed; because of the translation of one system of measurements into another; because, in the interval, the individual may grow taller as he ages, or grow shorter, if his spine curves. Similarly, measurements made by one observer upon the living man may not coincide with another's later measurements of the skeleton. These may be described as technical errors, and some, at least, are excusable.

But, in addition, measurements have crept into the literature that may have been taken in good faith, or otherwise, from circus advertisements, newspaper notices, and statements made by the giants' relations or managers. Measurements of both kinds are apt to be copied from writing to writing, until the original source is forgotten. There are also famous giants—sometimes noted for their actual height, sometimes only because of the popularity that follows long exhibition and exploitation. The best known giants are not always the tallest, just as the very tall may not be well known. There were a number of seemingly very important giants mentioned in the literature, as, for example, by Gould and Pyle, with measurements but no other data, and with no references to the original sources of publication by which the measurements could be verified. Should such cases be accepted as *bona fide*, even when the asserted heights seemed to exceed the possible limits, or should they be cast aside? For example, Gould and Pyle say "Keysler mentions seeing Hans Brau in Tyrol in 1550, and says that he was nearly twelve feet high!" It was a long time ago; scientific accuracy was not as great a virtue then as now; but could the man have been within three feet of that height? Present experiences make it so improbable, the reference has been cast aside.

Sometimes the heights of the giants are corrected and revised in later publications, with disappointing results, as will be shown later. Here is the original graduated list of such giants as were deemed worthy to be admitted to competition with the "Mütter American Giant":

LIST OF GIANTS ARRANGED ACCORDING TO HEIGHTS ORIGINALLY GIVEN

HEIGHT	*NAME*	*SOURCE OF INFORMATION*
10 feet 6 inches	Persian Giant	Fuchs, *J. A. M. A.*, 1935, **104**, 490.
9 " 4 "	Cajanus	Topinard, "Eléments d'Anthropologie," Paris, 1885.
9 " 3 "	John Middleton	Stedman's "Reference handbook of the medical sciences." 3 ed. Vol. 4, p. 700. N. Y., 1914.
9 " 3 "	Machnow	Lissauer & Lutchan, *Ztschr. f. Ethnologie*, 1905.
9 " 1 "	Hans Krav (Kraw)	Schereschewsky, *Endocrinology*, 1926, **10**, 17.
9 " (almost)	Murphy	Cited by C. J. S. Thompson, "Mystery and lore of monsters," London, 1930, p. 180.
8 " 10 inches	Dutch Giant	Gould & Pyle, "Anomalies and curiosities of medicine," Phila., 1897, p. 330.
8 " 10 "	Lombard Giant, "Hugo"	Symmers, *Interstate Med. J.*, 1917, **24**, 1013.
8 " 9 "	Fr. Winkelmeier	Virchow, *Ztschr. f. Ethnologie*, 1885, p. 469.
8 " 8 "	Russian Giant	Cushing, "Pituitary body and its disorders," Phila., 1912, p. 169.

HEIGHT	*NAME*	*SOURCE OF INFORMATION*
8 " 7 "	Peter Tuchan	Gould & Pyle, *loc. cit.*
8 " 6 "	Adam Clarke's Giant	Gould & Pyle, *loc. cit.*
8 " 6 "	Buffon's Swedish Giantess	Gould & Pyle, *op. cit.*, p 331.
8 " 6 "	Gallatin Giant	Lackey, *Phila. Med. J.*, 1899, **4**, 169.
8 " 5 "	Loushkin	Gould & Pyle, *op. cit.*, p. 331.
8 " 4¾ "	Robert Wadlow	Humberd, *J. A. M. A.*, 1937, **108**, 544.
8 " 4½ "	Marianne Wehde	Bollinger, "Ueber Zwerg- und Riesenwuchs," Heft 55 of Virchow & Holtzendorff's *Sammlung gemeinverständlicher Vorträge*. 1885.
8 " 4 "	Caleb or Kaleb	Hutchinson, *N. Y. Med. J.*, 1900, **72**, 89.
8 " 4 "	Chenoch or Henoch	Cited by Schereschewsky, *op. cit.*
8 " 4 "	Hunter's Irish Giant (Charles Byrn)	Gould & Pyle, *op. cit.*, p. 331 (citing various attributed heights).
8 " 4 "	Kalmuck Giant (Loushkin?)	Topinard, *op. cit.*, p. 436.
8 " 4 "	Constantine	Dufrane et al., Bull. & Mém. Soc. méd. d. Hôp. de Paris, 1903, **20**, 513.
8 " 4 "	Dublin Skeleton	Cited by Schereschewsky, *op. cit.*, p. 18.
8 " 4 "	Hugo brothers	Benard, Bull. et Mém. Soc. méd. d. Hôp. de Paris, 1923, **47**, 534.
8 " 3 "	John Turner	Cushing, *loc. cit.*
8 " 2 "	Abul Choul	Sirena, *Riforma med.*, 1894, **10**, 783.
8 "	Bernardo Gigli	Thompson, *op. cit.*, p. 162.
8 "	Chang Woo Gow	Ranke, "Der Mensch," v. 2 (1888), p. 133.
7 " 10 "	P. Cotter ("O'Brien")	Thompson, *op. cit.*, p. 168; et al.
7 " 10 "	C. MacGrath	Lanois et Roy, "Étude biologique sur les géants." Paris, 1904.
7 " 10 "	Drezel	Cited by Schereschewsky, *op. cit.*, p. 18.
7 " 9 "	James Toller	Stedman, *loc. cit.*
7 " 9 "	Ella Ewing	Hutchinson, *loc. cit.*
7 " 8 "	Thos. Hasler	Cited by Taruffi, *Boll. Sc. med.* (Bologna). 1886, **6**, 110.
7 " 8 "	Wm. Bradley	Thompson, *op. cit.*, p. 177.
7 " 8 "	Irishman at Hawick	Gould & Pyle, *op. cit.*, p. 332.
7 " 8 "	Greek Giant	Gould & Pyle, *op. cit.*, p. 333.
7 " 8 "	Bernard Coyne	Humberd, *loc. cit.*
7 " 7 "	Jacob Ehrlich (Jack Earl)	Humberd, *J. A. M. A.*, 1936, **106**, 1713.
7 " 7 "	Gilbert Reichert	Glen Lake Sanatorium (pers. comm.)
7 " 7 "	"Brice"	Thompson, *op. cit.*, p. 180; et al.
7 " 7 "	Amen Ates	Cited by Taruffi, *loc. cit.*
7 " 6 "	Mütter American Giant	Hinsdale, *op. cit.*

As a greater familiarity with the literature was acquired, it became evident that many of the measurements given and accepted for introduction into the list might be subject to revision and correction. Such corrections probably began with the famous giant Winkelmeier, who was studied by no less an authority than Virchow, who published a long series of anthropological measurements giving every detail, with the result that his height was placed at 250.3 cm. or 8′ 2″. But, later, Langer showed that an error in computation had been made and that the real height was only 227.8 cm. or 7′ 5″. In other accounts the height of this same giant has been given as 266 cm. or 8′ 9″, as 258.3 cm. or 8′ 7″, as 255 cm. or 8′ 4″. Woods Hutchinson reviewed the subject carefully and came to the conclusion that Langer was correct, and that the real height was 227.8 cm. or 7′ 5″.

At the present time Dr. Charles D. Humberd has become the American authority on giants. He has spent many years in collecting notes upon them, as well as in visiting and making the personal acquaintance of many of them. From his paper, "A Twenty-five Year Old Error in Measuring a Giant,"[5] a long list of criticisms and corrections enabled us to make astonishing alterations in our first list. For example, the Persian Giant was measured at Bushire, in Persia, by Prof. D. H. Fuchs of Vienna, as the giant was on his way to the Imperial Hospital, and found to be 320 cm., or 10′ 6″ tall. That height seemed to be so extraordinary that Humberd decided to investigate, and succeeded, through the Hon. Charles C. Hart of the American Legation at Teheran, in obtaining a complete copy of the hospital record, which showed that when the giant was admitted to the Imperial Hospital of the Imperial Health Department of Teheran he actually measured only 220 cm. or 7′ 2½″.

It is interesting to see how "Cajanus," Topinard's celebrated Giant, said to have been 9′ 4″ tall, also shrinks under careful scrutiny. Humberd says, "Topinard's celebrated Finlander, '283 cm. or 9′ 4″ tall,' is proved by Langer to have been the Finnish Giant Daniel Cajanus, who died in 1749." The bones of Cajanus are in the Leyden Museum, and his real height was 222 cm. or 7′ 3″.

[5] *J. A. M. A.*, 1936, **106**, 1713.

The case of John Middleton, 9′ 3″ tall, is one of those debatables of which it is difficult to dispose. Although several portraits of him are extant, there is no record of his having been accurately measured by any competent scientist. Upon his tomb is the carved statement that his height was 9′ 3″. No correction is possible, and one must either accept or reject the statement, made some time about the beginning of the last century.

Loushkin, 8′ 5″ tall, may never have existed: he is a wax model in Madame Tussaud's Museum in London, but is mentioned by Schereschewsky, and by Lanois and Roy.

HERE IS A REVISED LIST OF GIANTS TALLER THAN THE MÜTTER AMERICAN GIANT, CORRECTED FROM ALL RELIABLE SOURCES SO AS TO BE AS NEARLY AS POSSIBLE CORRECT

HEIGHT	*NAME*
9 feet 3 inches	John Middleton: no reliable information
9 "	Murphy
8 " 10 "	Dutch Giant
8 " 8 "	Cushing's Russian Giant
8 " $7\frac{1}{4}$ "	Robert Wadlow; measured again by C. D. Humberd, 5.11.38, and grown to this height
8 " 7 "	Peter Tuchan
8 " 6 "	Gallatin Giant: could not stand upright, measurement uncertain
8 " 6 "	Adam Clarke's Giant
8 " 6 "	Buffon's Swedish Giantess
8 " 5 "	Constantine
8 " 4 "	Hans Krav (Kraw)
8 " 4 "	Frederick the Great's Scotch Giant
8 " 2 "	Chenoch or Henoch
8 " 2 "	Caleb or Kaleb
8 " 2 "	Abul Choul or Aboul Houl
8 "	Bernardo Gigli
8 "	Chang Woo Gow
7 " 10 "	Patrick Cotter
7 " 10 "	Dresel, Drezel or Drasel
7 " 9 "	James Toller
7 " 9 "	Machnow
7 " $8\frac{3}{4}$ "	Hunter's Giant (Charles Byrn)
7 " 8 "	Thomas Hasler or Hassler (not Gessler)
7 " 8 "	Greek Giant
7 " 8 "	Bernard Coyne
7 " 8 "	William Bradley
7 " $7\frac{1}{2}$ "	Jacob Ehrlich (Jack Earl)

HEIGHT	NAME
7 " 7 "	Gilbert Reichert
7 " 7 "	Amen Ates
7 " 7 "	"Brice" (French Giant)
7 " 6 "	Mütter American Giant

It will be seen that our giant profits by this shrinkage of the others of his kind, for he moves forward from the forty-third to the thirty-first place. But perhaps justice is not yet done him, and if we wish still further to increase his dignity, there are two methods that might be followed. First, the elimination of those giants whose claims are based only upon hearsay mention by persons who never made measurements themselves, but willingly accepted the reports of others. By that method it might be possible to get rid of Murphy, whose height was said to be "almost nine feet"; the Dutch Giant exhibited at Parma, known only through mention by Gould and Pyle; Cushing's Russian Giant, whom he did not measure himself; Adam Clarke's Giant, simply mentioned by Gould and Pyle; Buffon's Swedish Giantess, whose height Buffon is said merely to have guessed at; Hans Kraw, who is known only as a portrait—it is the *portrait* that measures the nine feet in height; Chenock or Henock, whose description by Maas cannot be found; Drezel, mentioned by Bollinger, who never measured him; Thomas Hasler; the Greek Giant of Sinferpol,—nine in all, whose omission would advance our giant to the twenty-second place. Second, the allowance of the addition of three inches to compensate for the curvature of his spine, thus increasing his height from the 7′ 6″ that the skeleton actually measures, to 7′ 9″. He would then arrive at the 14th place, and be one of the world's greatest giants.

The Mütter American Giant is undoubtedly a person of importance in the world of giants. But it is a distinction accompanied by many drawbacks, for a cursory examination of the bones,—slender, curved, fragile, with ununited epiphyses,—and a glance at the pigeon breast and crooked back, are sufficient to show what feebleness and infirmity must have attended him during the "height" of his glory.

> "No further seek his merits to disclose
> Or draw his frailties from their dread abode."

Census of Incunabula in the Library of the College of Physicians of Philadelphia, 1938

Foreword

The last previous census of incunabula in the library of the College (See References, CPP) appeared in 1931 under the direction of Mr. Charles Perry Fisher, then librarian, who over a period of nearly half a century had fostered the growth of the splendid collection—one might add, a pioneer collection in this country—of medical and scientific texts printed in the 15th century. Since 1931 the College and its friends have, naturally, made additions to the collection. But a more cogent reason than this for a new census is the appearance within the past seven years of considerable additional bibliographical data on the incunabula-books. The Berlin Commission, for instance, has completed publication of three more volumes of the comprehensive Gesamtkatalog der Wiegendrucke (*Breviaire-Eigenschaften*); the British Museum, the seventh part of its monumental catalogue, while the sixth part, dated 1930, can not be regarded as having influenced our own catalogue materially. The sixth and seventh parts together embrace all of the British Museum incunabula printed in Italy, Venice excepted (Part V). So many of the early printed books being insufficiently documented by their printers, one may anticipate from all these recent authoritative volumes much additional assistance in arriving at a more nearly accurate answer to the always pertinent question: What, bibliographically speaking, have we got? Our interest in the question, it is possibly advisable to iterate, is not that of a collector idly fondling his bibelots. Apart from every other consideration, these books are tools of the medical profession—so in fact, so to be regarded. Let us remind ourselves, also, that the two similar collections which surpass ours are, properly, in the possession of great medical libraries—the Army Medical Library and the Boston Medical Library, the latter of which now leads the way in this particular.

From the standpoint of a collection of medical incunabula the most interesting of recent catalogues is, in some respects, the "Incunabula Scientifica et Medica" of Dr. Arnold C. Klebs, published within the present year (see References, K), and to be welcomed as the first contemporary attempt to define, on a comprehensive scale, the potential, legitimate contents of a collection such as ours. Klebs' list, furthermore, offers valuable data on works not yet reached in the necessarily slow progress of the Gesamtkatalog and the British Museum's catalogue (and on some probably never to be included in the latter).

Such assists as these enable us to rectify, or at least to modify in accord with the most expert contemporary opinion, the attributions of numerous editions to specific years, places, and printers. The Klebs list enables us also to compare our collection with a master-list of scientific and medical incunabula, and to draw suggestions therefrom which may be of help in the future. But as a fairly large number of our incunabula titles do not appear in the Klebs list, it is well to remind ourselves that many a book may have medical or scientific interest sufficient to justify its inclusion in an individual collection of medical and scientific works, and yet be properly excluded from a list of such works drawn up on a more rigidly scientific basis. Even lists of this latter kind are, of course, subject to the vagaries resulting from the personal equation—as their authors would be the first to admit. Nevertheless, we recognize the patent obligation to see that no book be admitted to a collection of so specific a character, if any perceptible amount of rationalization is required to smooth the way for its admission.

As general agreement on the proper spelling and order of the names of our authors, if hoped for, is not to be found—and no one catalogue lists all the authors in our collection—we have adopted arbitrarily the following principles in listing the names:

the Latin form is used, supposedly in the least eccentric spelling, but the name is in some cases also given in the vernacular [e.g.: Aegidius Corboliensis (Gilles de Corbeil)]; where a name that is, or might be, reasonably accepted as a surname was commonly used, that name is placed first [Andreae, Joh.]; where a surname was not commonly used, but is known, entry is made under the first name, the surname following in brackets [Joh. [de Gadesden] Anglicus]; where the first name is followed by one presumably indicating a place of origin, entry is made under the first name [Petrus de Abano]. These are debatable practices, of course, but the occasion is recognized as not ripe for debate. A list of cross references will, it is hoped, enable the authors to be tracked down with reasonable facility.

In the adoption of titles, which are indeterminate in many of the early books, we have consulted, when in doubt, not only the major catalogues, but the books themselves, and have very occasionally arrived at a form possibly not used elsewhere. In general, the attempt was to keep the titles brief, sufficiently explicit, and faithful (within reason) to the book. Such terms as *tractatus*, *expositio*, *commentarius*, etc. have usually been omitted. The titles under an individual author's name are in alphabetical order, disregarding, however, the alphabetical influence of the usual prepositions, *in*, *de*, *super*, etc.

While a certain amount of reckless individuality may be forgiven—nay, is almost mandatory—in these matters, this is not permitted the inexpert when it comes to assigning incompletely documented editions to specific years, printers, and places. Therefore, when one of our books lacks the treasured colophonic data, wholly or in part, substitutes are not supplied where the data would appear in the entry, had they been present in the book, but may be found in most cases attached to the appropriate reference-sources in the line next below. An exception is made where the name of the printer is present and can be taken as practically establishing the place of printing. The indication of date, other than the year, of printing has been bracketed whenever the date as given by us is an adaptation of the original form. When one reference-source has supplied a place-name and a following reference-source is drawn on for the name of a printer, no place being specified, the place is to be understood as that given in the first reference. References to Klebs, the Gesamtkatalog, and Hain or Copinger or Reichling, are given whenever an edition is listed in those catalogues, except in the cases of some editions listed, but not seen, by Hain. A reference to Hain, but not to Copinger and Reichling, does not necessarily mean that further data are not to be found in the latter two. References to Klebs are invariably placed first because the specific nature of his catalogue lends a peculiar appropriateness to such placement. References to our own, earlier, catalogue are made only when doubt might exist as to the identity of an edition whose current listing differs materially from the former entry. No attempt has been made to give an exhaustive list of references, the primary purpose of the census being merely to facilitate the identification of our editions. Additional references may in most cases be found in Klebs or in the Gesamtkatalog or in both.

The number of editions entered is 409, of which 126 are undated, at least in so far as the year of printing is concerned. These latter include at least six editions now generally regarded as belonging to the 16th century; but as their supposed illegitimacy can scarcely be established legally, and might some time even be disproved, it is thought best to keep them in their accustomed places.

The present census, finally, offers nothing but a "neat" (and, we hope, reasonably accurate) little list of 15th-century editions in the library of the College. Its purpose is wholly utilitarian. To dwell on the history of the individual books—and on their place in the history of human thought—has been almost irresistibly tempting; but it was impossible at this time. Even a skeleton, however, is not lacking in power to stimulate the imagination of those able to re-endow it with the habit of life.

EXPLANATION OF ABBREVIATIONS

* (following title or printer's notice): photostat-copy available for loan
* (preceding Hain number): edition seen by Hain

a.: after	n.a.: not after	n.d.: no date
b.: before	n.b.: not before	n.p.: no place
dev.: device	anon pr.: anonymous printer	

BMC: Catalogue of books printed in the XVth century now in the British Museum. Parts 1–7. London, 1908–1935.

C: Copinger, W. A.: Supplement to Hain's Repertorium bibliographicum. 2 parts in 3 volumes. London, 1895–1902.

CPP: [Fisher, Charles Perry]: A descriptive list of the incunabula in the library of the College of Physicians of Philadelphia. N. Y., Hoeber, [1931]. (Reprinted, with some re-arrangement, from *Ann. Med. Hist.*, 1931, n.s. **3**, 228–240; 325–354; 439–454.)

GW: Gesamtkatalog der Wiegendrucke. Hrsg. von der Kommission f. d. GW. Bd. 1–7. Leipzig, 1925–1938.

H: Hain, L.: Repertorium bibliographicum. 2 vols. Berlin, Altmann, 1925.

K: Klebs, Arnold C.: Incunabula scientifica et medica. Bruges, St. Catherine press, 1938. (Reprinted from *Osiris*, Vol. IV.)

PELL: Pellechet, M.: Catalogue général des incunables des bibliothèques de France. T. 1–**3** (T. 2–3 ed. by M. L. Polain). Paris, 1897–1909.

POL: Polain, M. L.: Catalogue des livres imprimés au quinzième siècle des bibliothèques de Belgique. T. 1–4. Bruxelles, 1932.

R: Reichling, D.: Appendices ad Hainii-Copingeri Repertorium bibliographicum. Fasc. 1–6 and Suppl. München (Suppl.: Münster), 1905–1914.

Census of Incunabula, 1938

Abiosus, Joh. Bapt.: *Astrologiae defensio.* Venice, Lapicida, 20 Oct. 1494.*

K 1.1. GW 6. H *24.

Abraham ben Ezra: *De nativitatibus.* Venice, Ratdolt, [24 Dec.] 1485.*

K 4.1. GW 113. H *21.

Abulcasis: *Liber Servitoris.* Venice, Jenson, 1471.*

K 5.1. GW 130. C 3450. CPP 39.

Aegidius Corboliensis (Gilles de Corbeil): *De pulsibus.* Padua, Cerdonis, Jan. 1484.*

K 465.1. GW 268. H *103.

De urinis. Padua, Cerdonis, 12 July 1483.*

K 464.1. GW 269. R iv, 98.

De urinis & De pulsibus. Venice, Vitalibus for Durantibus, 16 Feb. 1494.*

K 466.1. GW 270. H *101.

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K 466.3 [Lyons, 1500]. GW 272 [Havard, 1500 (?)]. R 1431.

Aegidius Romanus (Egidio [Colonna] da Roma): *In analytica posteriora Arist.* Venice, Luere for Torresanus, 18 May 1500.*

GW 7194. H *139.

In Arist. de generatione et corruptione. Padua, Herbort, 24, 29 Feb. 1480.

K 360.2. GW 7199. H *1692. CPP 60 (under Aristotle).

In physica Arist. Padua, Durantibus, 15 Oct. 1493.

K 364.1. GW 7197. H *128.

De regimine principum. Rome, Plannck, 9 May 1482.*

GW 7218. H *108.

Aeneas Sylvius (Pius II): *Epistolae familiares.* Nuremberg, Koberger, [17 July] 1486.

BMC II, 430. H *154.

Albertus Magnus: *De anima.* Venice, Novimagio, 1481.*

K 13.1. GW 585.

De animalibus. Mantua, Butzbach, 12 Jan. 1479.
K 14.2. GW 588. HC *546.

—— Venice, Gregoriis, 21 May 1495.
K 14.3. GW 589. H *547.

De coelo et mundo. Venice, Gregoriis, 18 Nov. 1490.*
K 15.1. GW 594. HC *511.

Compendium theologicae veritatis. Venice, Arnoldus, 5 April 1476.
GW 604. H *439.

De generatione et corruptione. Venice, Gregoriis, 10 June 1495.*
K 16.1. GW 613. HC *517.

Liber aggregationis. Augsburg, Schaur, [29 Aug.] 1496.*
K 18.12. GW 628. H *542.

De meteoris. Venice, Novimagio, 24 May 1488.*
K 20.1. GW 684. R iv, 104.

De mineralibus. Venice, Gregoriis, 22 June 1495.*
K 21.3. GW 688. H *522 *bis*.

*De mirabilibus mundi.**
K 22.3 [Santorso?, 1475]. GW 693 [Vicenza, Renensis, ca. 1475–82].

De muliere forti. Cologne, Quentell, [7] May 1499.
GW 699. H *465.

Paradisus animae. Strassburg, Flach, 10 July 1498.
GW 706. H *481.

Philosophia pauperum. Venice, Arrivabenus, [31] Aug. 1496.*
K 23.6. GW 713. H *506. CPP 20.

Physica. Venice, Gregoriis, 8 Jan. 1488.*
K 24.1. GW 716. R i, 89.

*De secretis mulierum et virorum.**
K 26.5 [Ulm, 1482]. GW 723 [Zainer]. H *551. CPP 29.

——*
K 26.9 [Strassburg, 1483]. GW 727 [Knoblochtzer, c. 1483]. H *558. CPP 31.

——*
K 26.19 [Antwerp, 1484]. GW 737 [Goes, ca. 1484]. C 191. CPP 32.

—— Augsburg, Sorg, [12 June] 1489.*
K 26.03. GW 764. H *8434. CPP 215 (under Henricus de Saxonia).

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K 26.49 [Cologne, 1490]. GW 760 [Koelhoff sen., ca. 1490]. CPP 33.

—— Leipzig, Lotter, 1500.*

K 26.18. GW 736.

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K 26.17 [Augsburg, 1500]. GW 735 [Froschauer, ca. 1500]. H *555. CPP 30.

—— Rome, 8 July 1499.*

K 26.05 [Venice, a. 1500]. GW 766 [Venice, Bevilaqua, a. 1500 (?)]. HC *566.

Summa de creaturis et de homine. Venice, Luere for Torresanus, 19 Dec., 16 Feb. 1498.*

K 27.1. GW 779. H *569. CPP 36.

Albertus de Saxonia: *In Arist. libros de coelo et mundo.* Venice, Locatellus for Scotus, [24 Oct.] 1492.*

K 30.2. GW 796. H *576.

Alchabitius: *Liber isagogicus ad scientiam iudicialem astronomiae.* Venice, Gregoriis, 26 July 1491.*

K 41.4. GW 845. H *618.

Alexander Aphrodisiensis: *De anima.* Brescia, Misintis, [13] Sept. 1495.*

K 45.1. GW 859. H *656.

Problemata. Venice, Strata, [24 Nov.] 1488, [18 Dec.] 1488, [3] Jan. 1488[9].*

K 44.1. GW 860. HC *658.

Almanac for the year 1494 (in German).

GW 1491 [Nuremberg, Hochfeder]. BMC II, 474. C 2271.

Andreae, Antonius: *Super metaphysicam Arist.* Venice, Strata, 21 Nov. 1482.*

K 65.1. GW 1674. H *983.

De tribus principiis rerum naturalium. Padua, Canozius, 1475.*

K 66.1. GW 1667. BMC VII, 908.

Andreae, Johannes: *Super arboribus consanguinitatis.* Nuremberg, Creussner, 1477.*

GW 1688. H *1030.

Antoninus Florentinus: *Confessionale: Defecerunt.* [N. p.], Fyner, [n. d.].
GW 2092 [Esslingen, n.a. 1474]. H *1171.

Apicius: *De re coquinaria.* Venice, Vitalibus, [n. d.].*
K 75.2 [1500]. GW 2268 [ca. 1500]. H *1282.

Arculanus, Johannes: *In primam fen quarti Can. Avicennae* (*de febribus*). Ferrara, Belfortis, 24 Jan. 1489.
K 80.1. GW 2316. BMC VI, 604.

Ardoynis, Santes de: *De venenis.* Venice, Ricius for Nigro, 19 July 1492.*
K 81.1. GW 2318. HC *1554.

Aristotle: *De animalibus.* Venice, Colonia & Manthen, 1476.
K 85.1. GW 2350. HC *1699.

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K 85.3 [Venice, 1495]. GW 2352 [Bevilaqua, ca. 1495]. H *1698. CPP 62.

De meteoris. Venice, Gregoriis, 22 Oct. 1491.*
K 91.2. GW 2421. H *1697.

Opera (in Latin). Venice, Stagninus, [var. dates] 1489.
K 82.3. GW 2339. H *1661.

—— (in Greek). Vols. I–V. Venice, Manutius, 1495–1498.
K 83.1. GW 2334. HC *1657.

Problemata. [N. p., anon. pr.], 1494.*
K 95.9 [Leipzig]. GW 2460 [Kachelofen]. H *1732.

—— Antwerp, Bac, [n. d.].*
K p. 52 [HC *1728 = 16th cent.]. GW II, col. 650 [16th cent.]. H *1728.

Arnoldus de Villanova: *De arte cognoscendi venena.**
K 98.1 [Mantua, 1473]. GW 2522 [Vurster]. H *1805.

*Breviarium practicae medicinae.**
K 103.2 [Pavia, 1485]. GW 2527 [Carcanus]. CPP 66.

—— Venice, Tortis, 21 Feb. 1494[5].*
K 103.3. GW 2528. H *1801.

—— Venice, Luna, [21 Oct.] 1497.*
K 103.4. GW 2529. HC *1802.

De vinis (in German).*
K 101.7 [Strassburg, 1484]. GW 2543 [Schott]. BMC I, 93. CPP 69.

De virtutibus herbarum. (CPP 70).

See under *Herbarius*, Vicenza, Achates & Papia, 1491.

Ars memorativa. Ingolstadt, [anon. pr., n. d.].*

K 111.3 [1499]. GW 2568 [Kachelofen]. H *1825.

Articella. Venice, Pincius, 26 Sept. 1491.*

K 116.4. GW 2681. H *1871.

—— Venice, Locatellus for Scotus, [20 Dec.] 1493.*

K 116.5. GW 2682. R iv, 124.

Auctoritates Aristotelis. Venice, [anon. pr., n. d.].*

K 121.5 [1495]. GW 2837 [Paganinis]. H *1924.

Augustinus, pseudo-: *Sermones ad heremitas.**

GW 3002 [Strassburg, Prüss, n.a. 1487]. H *1997.

Augustis, Quiricus de: *Lumen apothecariorum.* Venice, Gregoriis, 22 Sept. 1495.*

K 123.3. GW 3066. H *2120.

Ausonius, Dec. Magnus: *Opera.* Venice, Tacuinus, 11 Aug. 1494.*

GW 3092. H *2178.

Avenzoar: *Liber Teisir*; **Averroes**: *Colliget.* Venice, Gregoriis, 4 Jan. 1490[1].*

K 127.1. GW 3103. H *2186. (This copy lacks the Avenzoar and is otherwise defective.)

—— Venice, Luna, [23 Dec.] 1497.*

K 127.3. GW 3105. HC *2188.

Avicenna: *De animalibus.**

K 136.1 [Venice, 1500]. GW 3112 [Gregoriis]. H *2220.

Canon medicinae, I–V. Venice, Maufer & Co., 10 June 1486.

K 131.9. GW 3120. H *2205.

—— Venice, [anon. pr. for] Scotus, 24 March 1490.

K 131.11. GW 3122 [Locatellus]. BMC V, 438.

Metaphysica. Venice, Vitalibus for Durantibus, 26 March 1495.*

K 135.1. GW 3130. BMC V, 547.

Avienus, Rufius Festus: *Arati phaenomena*, etc. Venice, Strata, [25 Oct.] 1488.*

K 137.1. GW 3131. H *2224.

Bagellardus, Paulus: *De infantium aegritudinibus.* [Padua], Cerdonis, 10 Nov. 1487.*

K 139.3. GW 3167. R i, 99.

Baptista Mantuanus: *De patientia.* Basel, Bergmann, [17 Aug.] 1499.*

GW 3307. BMC III, 797.

Baptista de Salis: *Summa de casibus conscientiae.* Venice, Arrivabenus, [9] Sept. 1495.

BMC V, 385. H *1[4]183.

Barbarus, Hermolaus: *Castigationes Plinianae.* Cremona, Darleriis, [3] April 1495.

K 143.3. GW 3342. HC *2423.

Bartholomaeus Anglicus: *De proprietatibus rerum.* Cologne, Koelhoff sen., 1481.

K 149.4. GW 3405. HC *2501.

—— Nuremberg, Koberger, [30 May] 1483.

K 149.8. GW 3409. H *2505.

—— Strassburg, [anon. pr.], [14 Feb.] 1485.

K 149.9. GW 3410 [Husner]. H *2506.

—— (in Dutch). Harlem, Bellaert, [24 Dec.] 1485.

K 151.1. GW 3423. HC 2522.

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K 174.7. GW 3824. R vi, 99.

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K 177.3. GW 4082. HC 7797.

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K 184.1. GW 4130. H *2965.

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K 182.1. GW 4126. HC *2963.

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GW 4132. HC 2965.

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K 183.1. GW 4138. H *2974.

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GW 4409. H *3232.

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K 192.1. GW 4511. H *3351.

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GW 4954. H *3677.

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GW 4955. H *3672.

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K 207.3 [Strassburg, 1486]. GW 4986 [Grüninger]. H *3697.

—— [N. p., anon. pr.], [14 Sept.] 1487.*
K 207.5 [Augsburg]. GW 4988 [Sorg]. H *3703.

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K 225.1 *var.* GW 5593, n. l(c). H *4018.

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K 227.1. GW 5595. H *4021.

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K 228.1. GW 5596. H *4020.

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GW 5772. HCR 4133.

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K 233.1. GW 5780. HC 4141.

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K 232.4. GW 5777. H *4139.

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K 248.2 [1475]. GW 6018.

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K 252.1. GW 570. H *426. CPP 18.

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GW 6286 [Flach]. H *4721.

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K 260.1. GW 6456. H *4835.

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K 260.2. GW 6457. BMC VI, 750.

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K 260.3. GW 6458. H *4837.

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K 260.4. GW 6459. H *4838.

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K 262.1. GW 6471. H *4847.

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K 266.2 [1497]. GW 6515 [Locatellus]. H *4884.

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K 269.1 [Lyons, a. 1500]. GW VI, col. 420 [16th cent.]. H *4907.

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GW 6610 [Florence, Libri, ca. 1493]. HR 4930. CPP 141.

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K 272.1 [1481]. GW 6633. BMC V, 284.

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K 282.1 [1493]. GW 7164. H *5483.

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K 290.1 [1500]. GW [under Picus de Mirandula, Joh.]. R iv, 198.

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K 299.1. GW 7291. H *5615.

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K 310.5. GW 7824 [Husner]. H *5831.

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K 316.1 [Leipzig, 1490]. GW 7845 [Landsberg, ca. 1495]. H *5848.

[Decembrius], Petrus Candidus: *De genitura hominis.* Augsburg, Froschauer, [n. d.].*

K 327.9 [1498]. GW 8196. H *4320. CPP 123.

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K 329.1 [Padua, a. 4 July 1487]. GW 8285 [Cerdonis]. H *6095.

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GW [under Mayneriis, Maynus de]. BMC I, 249 [under Nic. Pergamenus]. HC 6126.

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K 335.6 [Mainz, 1494]. GW 8332 [Friedberg for Nell]. H *10546. CPP 269 (under Maldura, P.).

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K 336.1 [H *6170]. GW 8345. H *6170.

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K 336.1 [H *6166]. GW 8346. H *6166.

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K 336.3. GW 8348. H *6168.

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K 337.2 [Venice]. GW 8397n [Venice, Piasiis, 1492]. BMC V, 475 [Venice, Pensis].

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K 342.1. GW 8436. H *6258.

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K 343.1. GW 8435. H *6257.

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K 348.1. GW 8640 [Quarengis]. H *7125. CPP 177.

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K 349.2 [Strassburg, 1481]. GW 9042 [Rusch, ca. 1470]. H *6395.

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K 352.2. GW 9066. H *6451.

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BMC V, 287. H *6717.

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BMC VII, 933 [n.b. 15 July]. H *6711.

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K 385.8 [1498]. H *6828.

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K 591.1. HC 6839.

[Falcutius], Nicolaus: *Sermones medicinales VII.* (CPP 290–92.)

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K 389.1 (i). H *11767 (i).

Sermo ii (*De febribus*). Venice, Ricius, 9 July 1491.

K 389.4.

Sermo iii (*De membris capitis*). Venice, Stagninus, 24 Dec. 1490.

K 389.2 (iii). H *11768 (iii).

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K 389.2 (iv). H *11768 (iv).

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BMC VII, 1000. H *11767 (v).

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K 389.3 (v).

—— Venice, Stagninus, 18 June 1491.

K 389.2 (v). H *11768 (v).

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K 389.2 (vi). H *11768 (vi).

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K 389.2 (vii). H *11768 (vii).

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K 394.1. BMC VI, 783. H 7839, *7840. CPP 202, 203.

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K 395.1. H *6997.

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K 396.1. R ii, 169.

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K 399.2. H *7062.

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K 397.1. H *7065.

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K 397.3 [n.a. 1496]. C 2497.

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K 400.2 [Venice?, a. 1490]. R 1199 [Cristiner de Boll?].

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K 404.1. H *7121 *bis.*

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K 406.1. R iii, 160. CPP 324.

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BMC VI, 781. H 7393.

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K 429.2. R v, 137. CPP 216 (under Hentisberus, G.).

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K 427.1 [Treviso, 1476]. BMC VI, 891 [Hassia]. CPP 392.

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K 439.1. H *7501.

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K 441.1 [Rome, 1485]. BMC IV, 124 [Silber]. H *7505.

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K 442.4. H *7520.

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K 453.1 [Pavia, 1488?]. H *7574.

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K 450.2 [Padua, 1487?]. BMC VII, 924 [Cerdonis]. H *7569.

Super V Canonis Avicennae. [N. p.], [anon. pr. for] Durantibus, [n. d.].*
K 452.1 [Pavia, 1488?]. H *7568.

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K 457.1. H *8362.

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K 460.3 [Cologne, 1470]. BMC I, 190 [Zell]. H *7691.

*De diversis materiis moralibus.**
BMC I, 189 [Cologne, Zell]. H *7639.

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Pell 5185. Pol 1617.

Opera. Basel, Kessler, [12–21 March] 1489.
BMC III, 767. H *7624.

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C 2704. Pell 5209.

*De pollutione nocturna.**
K 459.4 [Cologne, 1470]. BMC I, 190. H *7695.

*De simplificatione cordis.**
BMC I, 190 [Cologne, Zell]. Pell 5230 [ca. 1470]. H *7681.

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K 463.1 [Ferrara, n.a. 1497].

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K 470.9 [Venice, 1489]. R 538.

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K 472.1. R ii, 179.

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H *7874.

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K 476.2 [Nuremberg, 1496–7]. H *8091.

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K 476.5 [Cologne, 1500]. BMC I, 306 [Zierikzee]. H *8092.

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K 480.3. R v, 130.

—— Pavia, Carcanus, 10 Jan. 1488.*

K 480.5. H *8098.

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K 492.1. C 1548.

Chirurgia parva. Venice, Locatellus for heirs of Scotus, [27 Jan.] 1500.*

K 497.1. R ii, 145.

Guido de Monte Rocherii: *Manipulus curatorum.**

BMC III, 742 [Basel, Flach]. R ii, 183 [1475].

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BMC V, 520.

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K 484.3. H *14152.

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K 487.3. BMC V, 414 [Saracenus]. H *14145.

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K 498.1. H *8350.

Henricus de Gorichem: *De superstitiosis casibus.**

BMC II, 511 [Esslingen, Fyner, n.a. 1473]. H *7807.

Herbals: *Herbarius.* [N. p.], Veldener (dev.), [n. d.].*

K 506.4 [Louvain, 1484]. CPP 217.

—— Vicenza, Achates & Papia, 27 Oct. 1491.*

K 506.10. BMC VII, 1033. CPP 70 (under A. de Villanova).

Herbarius zu Deutsch (*Gart der Gesundheit*). Augsburg, Schönsperger, [13 Aug.] 1493.

K 507.11. H *8954. CPP 228.

Herbier, Le Grant. Paris, Le Caron, [n. d.].

K 508.3 [1500]. G 2313/10 (under Arbolaire) [ca. 1498/1500].

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K 509.1. H *8944.

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K 509.3 [Strassburg, 1497]. BMC I, 124 [Prüss, n.a. 21 Oct. 1497]. H *8941. CPP 225.

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K 509.4 [Strassburg, 1499]. CPP 226.

Hermes Trismegistus: *Pimander.* Venice, Gorgonzola, 10 May 1493.*

K 510.5. H *8461.

Hippocrates: *De esse aegrorum.* Padua, 1483.*

K 518.1. R 557 [Cerdonis].

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K 519.1 [Rome, 1486]. BMC IV, 122 [Silber]. H *8669. CPP 219.

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K 519.3 [Rome, 1490]. R i, 152 [Plannck, 1490]. CPP 220.

Hugo Senensis (Ugo Benzi da Siena): *Super aphorismos Hippocratis.* Venice, Locatellus for Scotus, [23 May] 1498.*

K 1002.2. H *9012.

Circa la conservazione della sanità. Milan, Corneno, [31 May] 1481.*

K 1000.1. R v, 152.

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K 1001.2. R 1544 [Gerla].

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K 1003.2. BMC V, 450.

Super I Canonis Avicennae. Venice, Locatellus for Scotus, [27 April] 1498.*

K 998.2. H *9017.

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K 529.1. H *9358.

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H *9248. CPP 235.

Isaac Judaeus: *De particularibus diaetis.* Padua, Cerdonis, 23 March 1487.*

K 535.1. H *9267.

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K 536.6. H *9280.

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K 546.6. C iii, 261 (7251).

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K 548.4. C iii, 261 (7245).

Jacobus Philippus [Foresti] **Bergomensis**: *Supplementum chronicarum.* Venice, Benalius, 23 Aug. 1483.

BMC V, 370. H *2805.

—— Venice, Ricius, 15 Feb. 1492[3].*

BMC V, 404. H *2809.

Jacobus de Voragine: *Legenda aurea sanctorum.* 1481.*

BMC I, 96 [Strassburg]. C 6423. CPP 401.

Johannes [de Gadesden] **Anglicus**: *Rosa anglica medicinae.* Pavia, [anon. pr. for] Birreta, 24 Jan. 1492.*

K 424.1. BMC VII, 1005 [Girardengus]. H *1108. CPP 47.

Johannes Canonicus (Jean de Jandun): *Super physica Arist.* Venice, Scotus, 1481.*

K 553.2. H *4345. CPP 124.

Johannes [Gobii] **Junior**: *Scala coeli.* Ulm, Zainer, 1480.*

BMC II, 526. H *9406.

Johannes de S. Geminiano: *De exemplis et similitudinibus rerum.* Venice, Gregoriis for S. & B. Nallis, 10 April 1497.

K 562.3. H *7545. CPP 187.

—— Basel, Petri & Froben, [25 Jan.] 1499.

K 562.4. H *7546. CPP 188.

Jung, Ambrosius: *Regiment der Pestilenz.* Augsburg, Schönsperger, [14 Nov.] 1494.*

K 567.1. H *9473.

—— (*De pestilentia*). Augsburg, Schönsperger, 20 Nov. 1494.*

K 568.1. H *9472.

Kamintus (Canutus, etc. = Joh. Jacobi = Jean Jacme): *Regimen contra pestilentiam.**

K 245.10 [Cologne, 1490]. R 957 [Guldenschaff]. CPP 245.

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K 245.12 [Leipzig, 1492]. CPP 244.

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K 245.15 [Freiburg, 1495]. R 582 [Mainz, Meydenbach]. CPP 246.

Ketham, Joh. de: *Fasciculus medicinae.* Venice, Gregoriis, 15 Oct. 1495.*
K 573.2. H *9775.

Lacepiera, Petrus: *De oculo morali.* Venice, Hamman, 1 April 1496.*
K p. 243 [author probably = Petrus Limoviensis (Pierre de Limoges)]. BMC V, 426 [under Joh. de Peckham].

Lactantius: *Opera.* [Venice], Adam [de Ambergau], 1471.
BMC V, 188. H *9809.

—— Venice, Benalius, 22 March 1493.*
BMC V, 525. H *9816.

Leonicenus, Nicolaus: *De morbo gallico.* Venice, Manutius, June 1497.*
K 599.1. H *10019.

—— Milan, Le Signerre for Legnano, 4 July 1497.*
K 599.2. R v, 172.

De Plinii et aliorum in medicina erroribus. Ferrara, Rubeis & Grassis, 18 Dec. 1492.
K 598.1. H *10021.

Leupoldus de Austria: *Compilatio de astrorum scientia.* Augsburg, Ratdolt, [9] Jan. 1489.*
K 601.1. H *10042.

Lotharius (Innocentius III): *De miseria conditionis humanae.* Nuremberg, Creussner, 1477.*
BMC II, 449. H *10216.

Lucretius: *De rerum natura.* Verona, Fridenperger, 28 Sept., 1 Oct. 1486.*
K 623.2. R ii, 207.

Ludovicus de Prussia: *Trilogium animae.* Nuremberg, Koberger, 6 March 1498.
K 626.1. H *10315.

Lumen animae (by Berengarius?). [N. p., anon. pr.], [7 July] 1479.
K 631.3 [Reutlingen]. BMC II, 576 [Greyff]. H *10331.

Macer floridus de viribus herbarum.*
K 637.6 [Geneva, type Belot-Vivian, a. 1500].

Magister, Joh.: *Super tota philosophia naturali.* Parma, 12 Dec. 1481.*
K 639.1. BMC VII, 940 [Moyllis]. H *10447.

Magni, Jacobus (Jacques Le Grand): *Sophologium.*

K 595.2 [Strassburg, 1473]. BMC I, 61 [R-pr.]. H *10472.

—— [Paris], Baligault for Richard (dev.), [n. d.].*

K 595.14 [1498?]. C 3748.

Magninus: *Regimen sanitatis.**

K 640.5 [Lyons, 1500]. H *10482.

Maimonides: *Aphorismi.* Bologna, Benedictis for Hectoris, [29 May] 1489.*

K 644.1. H *10524.

—— Venice, Hamman, 10 Jan. 1500.*

K 644.2.

Regimen sanitatis. Florence, Ripoli, [n. d.].*

K 643.1 [1481?]. H *10525.

Manfredis, Hieronymus de: *De homine* (in Italian). Bologna, Rugeriis & Bertochus, 1 July 1474.*

K 653.1. R vi, 94.

Manilius: *Astronomicon.**

K 661.6 [Venice, a. 1494]. BMC V, 598 [Vitalibus].

Manliis, Joh. Jac. de: *Luminare maius.* Pavia, Carcanus, 9 April 1494.*

K 662.1. R iii, 101.

Martius, Galeottus: *De homine.**

K 670.1 [Bologna, 1471]. BMC VI, 813 [Pr. Barbatia, Johannina]. H *7433. CPP 182.

—— Milan, Mantegatiis for Lelius & Tantius, [19 Nov.] 1490.

K 670.3. H *7434.

Refutatio obiectorum Merulae. Venice, Rubeus, 1476.*

K 671.2. BMC V, 215.

Matheolus Perusinus: *De memoria augenda.**

K 674.8 [Rome, 1476]. R 253 [Silber]. CPP 274.

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K 674.9 [Strassburg, 1484]. BMC I, 91 [Knoblochtzer]. C 3912. CPP 273.

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K 674.11 [Rome, 1490]. BMC IV, 100 [Planck]. R 1570. CPP 275.

Matthaeus de Lucha: *De diebus criticis.* Rome, 1493.*

K 673.1. BMC IV, 136 [Fritag]. R v, 177.

Meffreth: *Sermones.* Nuremberg, Koberger, [14 Feb.] 1487.

BMC II, 431. H *11004.

Mensa philosophica.*

K 676.6 [Cologne, 1485]. BMC I, 258 [Guldenschaff]. H *11075.

Mercurius Corrigiensis, Joh.: *Contra pestem.**

K 677.1 [Rome, 1499-1505]. CPP 240.

Mesue: *Grabadin* (*Antidotarium*).*

K 680.10 [Strassburg, 1483-4]. H *11763. CPP 293. (Includes Nic. Salernitanus, Antidotarium).

Opera medicinalia. Venice, Novimagio, [31 Jan.] 1479.

K 680.8. H *11108.

—— Venice, Pasqualibus, [21 Nov.] 1490-18 July 1491.

K 680.13. H *11110.

Metlinger, Bartholomaeus: *Regiment der jungen Kinder.**

K 682.1 [Augsburg, a. 7 Dec. 1473]. BMC II, 321 [Zainer].

Molitoris, Ulricus: *De lamiis et pythonicis mulieribus.**

K 686.8 [Cologne, 1498]. BMC I, 307 [IA. 5209) [Zierikzee].

Montagnana, Bartholomaeus: *Consilia medica.* [Venice], Locatellus for Scotus, [2] Aug. 1497.

K 689.3. H *11552.

—— Venice, Luere for Torresanus, 20 Aug. 1499.

K 689.4. BMC V, 574.

De urinarum iudiciis. Padua, Cerdonis, 17 Feb. 1487.*

K 690.1. R v, 198.

Montis, Petrus: *De dinoscendis hominibus.* Milan, Zarotus, [17 Dec.] 1492.*

BMC VI, 722. H *11608.

Motis, Joh.: *Recommendatio mulierum contra viros.**

BMC II, 608 [Memmingen, Kunne]. H *11623.

Nider, Joh.: *De morali lepra.**

BMC I, 185 [Cologne, Zell].

Nifus, Augustinus: *In Averrois destructionem destructionum.* Venice, Locatellus for Scotus, 1 March 1497.*

K 704.1. GW 3106. H *2190. CPP 82 (under Averroes).

Ockam, Gulielmus de: *Summulae in Arist. physica.* Bologna, Hectoris, [13] Sept. 1494.*
K 706.1. H *11951.

[Offredi], Apollinaris, Cremonensis: *In I posteriorum Arist.* Venice, Locatellus for Scotus, [19 March] 1493.*
H *1284. CPP 49 (under Apollinaris).

Orbellis, Nicolaus de: *Expositio logicae cum textu Petri Hispani.* Venice, Albertinus, 10 March 1500.*
BMC V, 422. R iii, 123.

Ortolff von Bayerland: *Arzneibuch.* Nuremberg, Koberger, [17 March] 1477.*
K 715.2. H *12112.

Paulus Venetus: *In analytica posteriora Arist.* Venice, Anima Mia, 11 Aug. 1486.
BMC V, 410. HC 12512.

Summa naturalium Arist. Venice, Colonia & Manthen, 1476.*
K 732.1. H *12515.

—— Milan, Valdarfer, 17 July 1476.
K 732.2 [Venice (sic)]. BMC VI, 726 (IB. 26227). H *12516.

[Peachamus], Johannes, Cantuariensis (John Peckham): *Prospectiva communis.* [N. p.], [anon. pr. for] Corneno, [n. d.].*
K 738.1 [Pavia, 1482]. BMC VI, 759 [Milan]. H *9425.

Perottus, Nicolaus: *Cornucopia linguae latinae.* Venice, Tacuinus, 20 Dec. 1496.
BMC V, 531. H *12704.

Petrarca, Franciscus: *Epistolae familiares.* Venice, Gregoriis, [13] Sept. 1492.*
BMC V, 342. H *12811.

De remediis utriusque fortunae. Cremona, Misintis & Parmensis, 17 Nov. 1492.*
BMC VII, 956. H *12793.

Petrus de Abano: *Conciliator philosophorum.* Venice, Herbort, [5] Feb. 1483.
K 773.3. H *6.

—— Pavia, Grassis, 6 Nov. 1490.
K 773.4. H *3.

Expos. problematum Arist. [Venice], Herbort, 25 Feb. 1482.*
K 776.2. H *17.

*De venenis.**
K 774.4 [Rome, 1475]. R 1 [Lignamine]. CPP 3.

—— Rome, [29] April 1484.*
K 774.6. BMC IV, 83 [Plannck]. H *11. CPP 4.

—— [Padua], Cerdonis, 18 Dec. 1487.*
K 774.7. H *12.

—— Rome, 17 March 1490.*
K 774.8. H *13.

Petrus de Argellata: *Chirurgia.* Venice, Locatellus for Scotus, [22 Feb.] 1497[8].*
K 777.3. GW 2323. R iv, 121.

—— Venice, 12 Sept. 1499.*
K 777.4. GW 2324. R iv, 121.

Petrus Hispanus (Johannes XXI): *Tesoro dei poveri.* Venice, Ragazzo & Occimiano, 27 March 1494.*
K 748.2. R v, 144.

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K 748.3 [Florence, 1497]. BMC VI, 661 [Libri]. R v, 144.

Petrus Ravennas (Pietro Tomasi): *Phoenix s. Artificiosa memoria.* Venice, Choris, 10 Jan. 1491[2].*
K 977.1. H *13697.

Peyligk, Joh.: *Compendium philosophiae naturalis.* Leipzig, Lotter, [12] Sept. 1499.*
K 754.1. H *12861.

Phalaris: *Epistolae.**
Cat. l'Art Ancien (1928) [According to Berlin Commission, Venice, Pincius, ca. 1495]. R 676 [Bologna, Azoguidus, ca. 1480].

Philelphus, Franciscus: *Orationes et alia opuscula.* Venice, Pincius, [1] June 1496.
K 403.6. H *12925.

Picus de Mirandula, Joh.: *Opera.* Bologna, Hectoris, 20 March 1496.
K 764.3 [Lyons, Suigus & Benedictis, 1498–1500]. C 4750.

Pintor, Petrus: *Aggregator sententiarum de pestilentia.* Rome, Silber, 20 Feb. 1499.*
K 779.1. BMC IV, 119.

Platina, Bartholomaeus: *De honesta voluptate.* Cividale, Lisa, [24 Oct.] 1480.*

K 783.3. H *13052.

—— Bologna, Benedictis, 11 May 1499.

K 783.6 *var.* H *13056.

Plato: *Opera.* Venice, Choris & Luere for Torresanus, 13 Aug. 1491.

K 785.2. H *13063.

Pliny the Elder: *Historia naturalis* (in Italian). Venice, Jenson, 1476.

K 787.1. H *13105.

—— (in Latin). Parma, Portilia, [8] July 1481.

K 786.8. H *13094.

Pliny the Younger: *Epistolae.* Treviso, Rubeus, 1483.*

BMC VI, 896. H *13113.

Plotinus: *Opera.* Florence, Miscomini, [7] May 1492.

BMC VI, 640. H *13121.

Poggius Florentinus: *Facetiae.* Venice, 10 April 1487.*

H *13193.

—— [Paris], Niger (dev.), [n. d.].*

C 4787 (either a var. or C. has corrected 2 typographical errors).

Politianus, Angelus: *Miscellaneorum centuria prima.* Florence, Miscomini, [19 Sept.] 1489.*

BMC VI, 638. H *13221.

Ptolomaeus: *Quadripartitum.* Venice, Locatellus for Scotus, [20 Dec.] 1493.*

K 814.2. H *13544.

Publicius, Jacobus: *Ars memorativa.* Paris, [anon. pr. for] Aliate, [n. d.].*

K 815.5]1495].

Ars oratoria: Artes epistolandi et memorandi. Venice, Ratdolt, [31 Jan.] 1485.*

K 816.2. H *13546.

Purliliarum, Jacobus, Comes: *De generosa liberorum educatione.* Treviso, Lisa, 11 Sept. 1492.*

BMC VI, 885. H *13608.

Quaestiones naturales philosophorum. Cologne, Zierikzee, [n. d.].*

K 821.3 [a. 1500]. R 706 [ca. 1500].

Rabanus Maurus: *De universo.**

K 524.1 [Strassburg, 1474?]. BMC I, 60 [R-pr. b. 20 July 1467]. H *13669.

Raymundus de Sabunde: *Theologia naturalis.* Deventer, Paffroet, [n. d.].

K 824.1 [b. 1485]. H *14067.

Regimen sanitatis Salernitanum.

K 829.1 [Cologne, 1480]. BMC I, 250 [Winters]. CPP 335.

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K 829.4 [Louvain]. C 5057 [Westphalia]. CPP 334.

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K 829.6 [Louvain]. C 5056 [Westphalia]. CPP 336.

—— (in French).*

K 830.1 [Lyons, type Du Pré, 1491]. C 5048. CPP 343.

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K 830.6 [Lyons, type Math. Huss, 1486]. H *13747. CPP 333.

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K 830.8 [Lyons, type Siber, 1495]. C 5058. CPP 337.

—— Strassburg, [29 Dec.] 1491.*

K 830.10. BMC I, 142 [Pr. Jor. de Qued.]. H *13758. CPP 341.

——

K 830.13 [Venice, type Vitalibus, 1500]. C 5052. CPP 344.

—— Strassburg, [29 Dec.] 1491.*

K 830.15 [Venice, 1500]. BMC V, 379 [Benalius]. H *13757. CPP 340. (*Reprint of K 830.10 above.*)

—— Venice, Vitalibus, [n. d.].*

K 830.16 [a. 1500]. R 708. CPP 342.

——

K 831.2 [Paris, type Marchand]. C 5063. CPP 338.

Regius, Raphael: *Epistolae Plinii enarrationes.* Venice, Anima Mia, [23 May] 1490.*

BMC V, 411. H *13810.

[Reinerus]: *Fagifacetus.**

K 845.2 [Basel, a. 1 April 1490]. BMC III, 781 [Furter]. H *6900.

[Reuchlin, Joh.]: *Vocabularius breviloquus.* Basel, 1478.

BMC III, 745 [Amerbach]. C 6285.

Rhasis: *Liber ad Almansorem*, etc. Milan, Pachel & Scinzenzeler, [14 Feb.] 1481.

K 826.1. R i, 182. CPP 347.

—— Venice, Locatellus for Scotus, 7 Oct. 1497.

K 826.2. H *13893.

—— [With comm. of S. de Nigris]. Venice, Luna, [21 July] 1497.*

K 946.4. H *13897.

Robertus [Grosseteste] **Linconiensis**: *Summa super physica Arist.*; **Thomas Aquinas**: *Super physica Arist.* Venice, Quarengiis for Calcedonius (dev.), 22 April 1500.*

K 851.1. R ii, 204. CPP 53 (wanting the Grosseteste).

Rodericus Zamorensis: *Speculum vitae humanae.* Augsburg, Zainer, [11] Jan. 1471.*

K 857.3. H *13940.

[Rolewinck, Werner]: *Fasciculus temporum.* [Cologne], Quentell, 1480.*

BMC I, 263. H *6925. CPP 167.

—— Strassburg, Prüss, 1488.

BMC I, 121. H *6937. CPP 168.

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BMC I, 127 [Strassburg, Prüss, n.b. 1490]. H *6915. CPP 166.

*Formula vivendi canonicorum.**

HC *7253 [Cologne, ter Hoernen (?), c. 1477]. CPP 179.

Rosellis, Antonius de: *De ieiuniis.**

R 311 [Rome, Guldenbeck, 1480].

Rudolphus de Novimagio: *Legenda Alberti Magni.**

BMC I, 255 [Cologne, Guldenschaff]. C 4443 [ca. 1483]. CPP 295.

Sabellicus, Marc. Anton.: *Rerum Venetarum decades.* Venice, Torresanus, 21 May 1487.

BMC V, 308. H *14053.

Sacrobusto (Sacrobosco), **Joh. de**: *Sphaera mundi.* Venice, [anon. pr. for] Scotus, [4] Oct. 1490.*

K 874.14. BMC V, 438 [Locatellus]. H *14113.

Salemo: *Glossae.*

K 877.1 [Augsburg, 1474]. BMC II, 340 [SS. Ulrich & Afra]. H *14134.

Savonarola, Hieron.: *Epistola a suoi fratelli in Cristo.**

BMC VI, 651 [Florence, Libri, a. 15 July 1497]. C 5306.

Savonarola, Joh. Mich.: *De balneis.* Ferrara, Belfortis, 10 Nov. 1485.*
K 884.1. H *14493.

—— Venice, Pensis, 20 Nov. ——.*
K 884.3 [1496]. H *14492.

De febribus. Venice, Pensis, 16 Oct. 1496.*
K 885.2. H *14488.

Practica medicinae. Venice, Locatellus for Scotus, [27 June] 1497.*
K 882.3. H *14484.

De pulsibus, urinis et egestionibus. Venice, Pensis, 10 Feb. 1497.*
K 886.2. H *14491.

Scanarolus, Antonius: *De morbo gallico.* Bologna, 26 March 1498.*
K 887.1. BMC VI, 844 [Hectoris]. H *14505.

Schedel, Hartmannus: *Buch der Chroniken.* Nuremberg, Koberger, 23 Dec. 1493.
K 890.1. H *14510.

Schellig, Conradus: *In malum de Francia.**
K 891.1 [Heidelberg, 1495]. BMC III, 668 [Misch]. R 727.

Schrick, Michael: *Von der ausgebrannten Wassern.* Augsburg, Bämler, [12 July] 1482.*
K 895.11. C 5318.

Scotus, Michael: *Physiognomia.* 1477.*
K 899.1 [Venice]. BMC V, 242 [Fivizano]. H *14550.

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K 899.8 [Basel, 1486]. R Suppl., p. 83 [Wenssler, 1480]. CPP 369.

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K 899.16 [Venice, 1492]. BMC V, 421 [Rubeus]. H *14546. CPP 370.

Seneca, L. A.: *Epistolae, etc.* Venice, Choris, [31] Oct. 1492.*
BMC V, 466. H *14594.

Serapion: *Opera medicinalia.* Venice, Novimagio, 8 June 1479.*
K 911.1. H *14692.

—— Venice, Locatellus for Scotus, [16 Dec.] 1497.*
K 911.2. H *14695.

Serenus Samonicus, Quintus: *Carmen medicinale.**
K 914.2 [Rome, 1487]. BMC IV, 124 [Silber].

Sermoneta, Joh.: *Super aphorismos Hippocratis et libb. tegni Galeni.* Venice, Locatellus for Scotus, [31] March 1498.*

K 915.2. H *14701.

Silvaticus, Matthaeus: *Liber pandectarum medicinae.* Vicenza, Lichtenstein, [n. d.].

K 919.4 [1480]. H *15193.

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K 919.6 [Strassburg, 1481]. BMC I, 64 [R.-pr.]. H *15192.

—— Venice, Saracenus, [19 May] 1488.*

K 919.7. H *15200.

—— Venice, Stagninus, 27 March 1499.

K 919.10. H *15199.

Simon Genuensis: *Synonyma medicinae.* Milan, Zarotus, 3 Aug. 1473.*

K 920.2. R iii, 183.

—— Venice, Anima Mia, 13 Nov. 1486.*

K 920.4. H *14749.

[Sprenger, Jac. & Institoris, Henricus]: *Malleus maleficarum.**

K 926.3 [Speier, 1492?]. BMC II, 498 [Drach]. H *9240. CPP 234.

Tartaretus, Petrus: *Expos. philosophiae et metaphysicae Arist.* [Lyons], Wolff, 10 Dec. 1500.

K 951.3. HC 15345.

Themistius: *Paraphrasis in Arist.* Venice, Zanis for Scotus, [6] Oct. 1499.*

K 955.2. H *15464.

Theobaldus: *Physiologus de naturis XII animalium.**

K 956.4 [Cologne, 1489]. BMC I, 273 [Quentell]. H *15467.

Theophrastus: *De historia plantarum.* Treviso, Confalonerius, 20 Feb. 1483.

K 958.1. H *15491.

Thomas Aquinas: *Super libros Arist. de anima.* Pavia, Lavalle, [30] Sept. 1488.*

K 963.3. BMC VII, 1012.

Super libros Arist. de generatione et corruptione. Venice, Locatellus for Scotus, [22 Dec.] 1498.*

K 965.3. R iv, 117.

Opuscula. Venice, Lichtenstein, [7] Sept. 1490.

BMC V, 358. H *1541.

Tornamira, Joh. de: *Super nono Almansoris Rhasis.* Lyons, Trechsel, 17 June 1490.*

K 984.1. H *15551.

Torrella, Hieron.: *De imaginibus astrologicis.* Valencia, Alf. de Orta, [n. d.].*

K 981.1 [prob. Barcelona, a. 1500]. R vi, 171.

Tura de Castello: *De balneis sec. Gentilem de Fulgineo & Fr. de Senis.* [Padua], Renensis, 24 March 1473.*

K 444.1 (under Gentilis). H *4592. CPP 128.

Turisanus (Torrigiano): *In microtegni Galeni.* Venice, Locatellus for Scotus, [12] April 1498.*

K 983.3. H *15684.

Valascus de Tarenta: *De epidemia et peste.**

K 1007.1 [Turin or Piedmont, 1473]. GW 2523 [Italy, ca. 1474?]. H *15245. CPP 386.

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K 1007.2 [Basel, 1474]. BMC III, 741 [Flach]. H *15244. CPP 385.

Valla, Georgius (*transl.*): *Nicephori Logica*, etc. Venice, Bevilaqua, [30] Sept. 1498.*

K 1012.1. H *11748 (under Nicephorus). CPP 289.

Versehung von Leib, Seele, Ehre und Gut. Nuremberg, 1489.*

K 1028.1. BMC II, 463 [Wagner]. H *16019.

Victor, Sextus Aurelius: De viris illustribus.*

BMC V, 174 [Venice, Jenson]. H *2131. CPP 78.

Vincentius Bellovacensis: *Speculum naturale.*

K 1036.1 [Strassburg, 1475 or later]. BMC I, 64 [R-pr.]. C 6256.

[Vinum]. *De vino et eius proprietate.**

K 1038.4 [Rome, 1495]. BMC IV, 141 [Besicken & Mayr]. R 351. CPP 396.

Wernherus, Abbas S. Blasii: *Deflorationes patruum.* Basel, 1494.

BMC III, 788 [Furter?]. H *16158.

Wirecker, Nigellus: *Brunellus in speculo stultorum.**

BMC III, 631 [Leipzig, Kachelofen]. H *16217.

Zeno, Antonius: *De natura humana.* Venice, Bertochus, 1 Jan. 1491 [2], 1492.*

K 1055.1. H *16281.

Abano. S. Petrus.
Aben Ezra. S. Abraham ben Ezra.
Aegidius Columna. S. Aeg. Romanus.
Aegidius Monachus. S. Aeg. Corboliensis.
Albertus Carrariensis. S. Carrara.
Albertus Magnus, CPP 20. S. A.M, *Philosophia pauperum.*
Albucasis. S. Abulcasis.
Alexander Benedictus. S. Benedictus.
Anglicus de Gatisden. S. Johannes.
Apollinaris Cremonensis. S. [Offredi].
Aquino. S. Thomas. For CPP 53, S. Robertus
Argellata. S. Petrus.
Aurelius Victor. S. Victor.
Averroes, *Destructiones destructionum.* S. Nifus.
Bartholomaeus de Glanvilla. S. Barth. Anglicus.
Benzi. S. Hugo Senensis.
Berengarius. S. Lumen animae.
Bergomensis, J. P. S. Jac. Phil. [Foresti] Berg.
Buch der Natur. S. Conrad v. Megenberg.
Candidus. S. [Decembrius].
Canonicus. S. Johannes.
Canutus. S. Kamintus.
Castello. S. Tura.
Cauliaco. S. Guido.
Cerasianus. S. Breitenbach, Joh. & ——.
Chauliac. S. Guido.
Cherubini da Spoleto. S. Ch. da Siena.
Dionysius de Leuwis. S. D. Cartusianus.
Egidio da Roma. S. Aegidius Romanus.
Epist. graecae var. auctorum. S. *Epist. divers. philos.*
Fagifacetus. S. [Reinerus].
Fasciculus temporum. S. [Rolewinck].
Flandria, D. de. S. Dominicus de Fl.
Forlivio. S. Jacobus de F.
Formula vivendi canonicorum. S. [Rolewinck].
Galeottus Martius. S. Martius.
Geminiano. S. Joh. de S. Gem.
Gilles de Corbeil. S. Aegidius Corboliensis.
Gordonio. S. Bernardus de G.
Gorichem. S. Henricus de G.
Grosseteste. S. Robertus.
Harderwyck, Ger. de. S. Gerardus de H.
Henricus de Saxonia. S. Albertus Magnus, *De secretis mul.* (K 26.03).
Hentisberus. S. Gaietanus de Thienis, *Expos. reg. Hentisberi.*
Herbarius. S. Herbals.
Herbier, Grant. S. Herbals.
Hortus sanitatis. S. Herbals.
Hispanus, P. S. Petrus H.
Hrabanus Maurus. S. Rabanus.
Innocentius III. S. Lotharius.
Institoris. S. Sprenger, Jac. & ——.
Instructiones confessorum. S. *Instructio simpliciorum. . . .*
Jacme, Jean. S. Kamintus.
Jacobi, Joh. S. Kamintus.
Jean de Jandun. S. Joh. Canonicus.
Johannes XXI. S. Petrus Hispanus.
Johannes Mercurius. S. Mercurius.
Johannes Peachamus. S. [Peachamus], Joh.
Konrad v. Megenberg. S. Conrad.
Le Fèvre d'Etaples, Jacq. S. Faber Stapulensis, Jac.
Le Grand, Jacq. S. Magni, Jac.

Linconiensis, R. S. Robertus.

Lucha, Matth. de. S. Matthaeus.

Maldura. S. Diedus, Franc.

Mayneriis, M. de. S. *Dialogus creaturarum.*

Megenberg, C. v. S. Conrad.

Nicolaus Falcutius. S. [Falcutius]. For CPP 293, s. Mesue, *Grabadin* (K 680.10).

Nicolaus Pergamenus. S. *Dialogus creaturarum.*

Novimagio, R. de. S. Rudolphus.

Nursia. S. Benedictus.

Peckham. S. [Peachamus]. Also, Lacepiera.

Petrus Limoviensis. S. Lacepiera.

Phagifacetus. S. [Reinerus].

Pierre de Limoges. S. Lacepiera.

Pius II. S. Aeneas Sylvius.

Platea, Franc. de. S. Franciscus.

Prognosticon de mutatione aeris (CPP 324). S. [Firminus de Bellavalle].

Ravennas. S. Petrus Rav.

Razi. S. Rhasis.

Rodericus Sanctius. S. Rod. Zamorensis.

Sabunde. S. Raymundus de S.

Sacrobosco. S. Sacrobusto.

Saliceto. S. Gulielmus.

Salis, Bapt. de. S. Baptista.

Scriptores astronomici vet. S. Firmicus.

Syllanus de Nigris. S. Rhasis, *Lib. ad Almansorem* (K 946.4).

Sylvaticus. S. Silvaticus.

Tarenta. S. Valascus.

Thienis. S. Gaietanus.

Tomasi, P. S. Petrus Ravennas.

Torrigiano. S. Turisanus.

Tournemire. S. Tornamira.

Tract. de urinis (CPP 395). 16th c. (K, p. 324).

Tract. de vino. S. [Vinum]. *De vino*, etc.

Villanova. S. Arnoldus.

Vincent of Beauvais. S. Vincentius Bellov.

Vocabularius breviloquus. S. [Reuchlin].

Voragine. S. Jacobus de Vor.

College of Physicians of Philadelphia

Schedule of Lectures,* 1938–1939

SCIENTIFIC LECTURES

October 12, 1938. James M. Anders Lecture XIII. Homer F. Swift, M.D., and Alfred E. Cohn, M.D., Members of the Rockefeller Institute for Medical Research. "Cardiac Diseases: Infectious and Non-Infectious, Course and Consequences."

November 2, 1938. Edward A. Strecker, M.D., Professor of Psychiatry, University of Pennsylvania. "Should Psychoanalysis Be Purged?"

December 7, 1938. Thomas Dent Mütter Lecture LI. William Boyd, M.D., Professor of Pathology and Bacteriology, University of Toronto; Pathologist, Toronto General Hospital. "Some Reasons for the Recent Increase in Bronchial Carcinoma."

January 4, 1939. Nathan Lewis Hatfield Lecture XXI. Walter Bauer, M.D., Associate Professor and Tutor in Medicine, Harvard Medical School; Physician, Massachusetts General Hospital, Boston. "Studies Pertaining to the Origin and Nature of Hypertrophic Arthritis."

February 1, 1939. Nathan Lewis Hatfield Lecture XXII. C. N. H. Long, M.D., Sterling Professor of Physiological Chemistry, Yale University. "Diabetes Mellitus in the Light of our Present Knowledge of Metabolism."

March 1, 1939. Mary Scott Newbold Lecture XLII. W. B. Castle, M.D., Professor of Medicine, Harvard Medical School; Associate Director, The Thorndike Memorial Laboratory, Boston City Hospital. "The Diagnosis and Treatment of Anemia."

April 5, 1939. Claude S. Beck, M.D., Associate Professor of Surgery, Western Reserve University; Associate Surgeon,

* Meetings begin at 8:30 P.M.

University Hospitals, Cleveland. "The Surgical Approach to Diseases of the Heart."

May 3, 1939. Mary Scott Newbold Lecture XLIII. William J. Kerr, M.D., Professor of Medicine, University of California; Physician-in-chief, University Hospital, San Francisco. "A New Approach to the Etiology and Treatment of Angina Pectoris."

LECTURES FOR THE GENERAL PUBLIC

November 18, 1938. Alfred Stengel, M.D., Vice-President in Charge of Medical Affairs, University of Pennsylvania. "Currents and Counter-Currents in the Progress of Medicine."

January 20, 1939. George P. Muller, M.D., Professor of Surgery, Jefferson Medical College. "Surgical Trends and Medical Progress."

April 14, 1939. Earl D. Bond, M.D., Professor of Psychiatry, University of Pennsylvania; Formerly Director, The Institute for Mental Hygiene, Pennsylvania Hospital. "The Modern Interpretation of Mental Disorders."

Cardiac Diseases, Infectious and Non-Infectious, in Relation to Public Health*†

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Part I

Introduction

Because vital statistics indicate that the group comprised under the caption "heart diseases" now constitutes the largest causes of death, it becomes extremely important to determine, if possible, what public health measures may be undertaken to prevent these diseases, or by delaying their progress, to prolong the useful days of the patients, and eventually to alleviate their suffering; and finally it is essential to determine what part of the situation is, and probably always will be, unamenable to special prophylactic measures because it is inextricably involved in the aging process.

In man's progress through life various diseases affect his cardiovascular system, and, to a considerable degree, each one is connected with certain age-periods. These predominantly age-linked characteristics emphasize the plurality of heart diseases. While in their terminal symptomology most of them resemble one another, in their incipiency they may be so stealthy that the most careful technique is required to detect their presence. Injuries inflicted in one age-period may not become manifest until a decade or two later.

Congenital defects or rheumatic scars prepare the soil for bacterial infections of the valves; and an infectious vascular disease of youth may accelerate the progress of senescence. While remoteness of cause and effect make prolonged observa-

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tion necessary to describe the life history of these maladies, this long interval may in some instances offer us a chance to institute prophylactic or palliative measures.

The two predominant causes of infectious heart diseases are rheumatic fever and syphilis. If and when known measures for the diagnosis and treatment of syphilis are effectively applied, the problem of cardiovascular disease due to this infection will no longer exist. The question of the effectiveness of antisyphilitic treatment after the establishment of syphilitic aortitis is a moot point, insofar as prolonging life is concerned, but there can be little doubt of the relief of symptoms in many cases. As both the medical and lay public are beginning to appreciate the nature of the problem of syphilis and a number of projects are on foot to answer undecided questions, I shall devote the remainder of this presentation to the subject of rheumatic heart disease.

RHEUMATIC CARDITIS

While complete understanding of the etiology and pathogenesis of a disease is highly desirable for its prevention and treatment, still, many cases of malaria were probably cured by cinchona bark long before Laveran discovered the plasmodium; and efficient exhibition of mercury and potassium iodide controlled many manifestations of syphilis prior to Schaudinn's and Hoffmann's epic-making announcement. A short time later, in experimental syphilis of anthropoids, came the demonstration of the effective prophylactic action of calomel when early applied to a freshly infected area. It is well to recall the value of these empirically learned facts in order not to despair of applying some beneficial measures to rheumatic carditis even without the demonstration of the etiological agent.

Nevertheless, knowledge of the life history and pathogenesis of a malady is important in determining its treatment. First, it is essential to recognize the time factors involved. Except in those rare instances where a fulminant affection quickly closes the scene, rheumatic carditis is not an acute disease. Moreover, the basic infection, rheumatic fever, usually requires months, rather than weeks, for its healing; hence the descriptive adjective "acute" should be deleted from our nosological nomenclature insofar as rheumatic carditis is concerned, for try as we may to discount the influence of words our attitude towards a malady is inevitably influenced by a constantly repeated descriptive term.

If we can logically apply to the heart the information gained from observing rheumatic arthritis and subcutaneous nodules, it seems that the exudative response to the focal injury of the mesenchymal ground substance, i.e., the collagen and elastica, is acute in its appearance and relatively short in duration; but the subsequently appearing granulomata persist weeks or months; and the final scar formation goes on still longer. Furthermore, there are highly suggestive observations pointing to the influence of physiological trauma upon the localization of rheumatic lesions as well as upon their persistence in an already affected tissue. For example: while rheumatic arthritis usually occurs first in the knees and ankles, it more often localizes early in the hands and arms in the case of needleworkers and laundresses. Furthermore, we have observed cases in which physical trauma in a certain joint had preceded the primary focalization of rheumatic inflammation in that area; in others, a bruise apparently induced a focal relapse which was subsequently followed by migratory polyarthritis. Likewise, subcutaneous nodules, which are prototypes of the proliferative stage of the rheumatic inflammation, occur most frequently in areas subjected to physiological stress, such as tendons and tendon sheaths as they pass over joints, or over structures specially subjected to pressure, such as the olecranon or the patella. The influence of trauma is further illustrated by the recent experimental induction of subcutaneous nodules by Massel, Mote and Jones (1937) who injected the blood of rheumatic patients subcutaneously over the posterior aspect of the elbows of rheumatic subjects and then repeatedly irritated these areas by rubbing. Probably mechanical factors constitute one element in the pathogenesis of rheumatic carditis, and in subsequent scarring, because incessant and great motion, stress and strain are inevitably connected with the function of the various parts of the heart; and it is noteworthy that, even though there is considerable evidence indicating that the bases of all of the valves are acutely inflamed during the early stages of rheumatic carditis (Gross & Friedberg, 1936 a and b), those valves subjected to the most intense physiological trauma are the ones in which scarring and deformity most frequently occur. It is, therefore, at least plausible to postulate that the high incidence of carditis in rheumatic fever is conditioned to a considerable degree by the ceaseless activity and constant strain occurring in this organ; hence a direct therapeutic corollary is to reduce the physiological requirements of the body as much as possible during the entire period that the heart harbors rheumatic inflammation, and thus to diminish, even though it is impossible to abolish completely, the ultimate amount of scar formation.

The relapsing nature of the rheumatic infection is another important factor conditioning the development of rheumatic heart disease. Not only is this tendency seen in recurrences occurring years apart, but also during a single attack of the disease. In carefully documenting the clinical manifestations, the temperature, pulse and respiration and the laboratory findings, how often do we repeatedly encounter evidence of reactivation of the rheumatic process in a patient who appears on the road to recovery. In such a document one can detect the repeated struggles between the immune mechanisms on the one hand and the infectious processes on the other. This so-called polycyclic nature of the disease, long recognized, is encountered in both children and adults; and at times is very striking in women, in whom the relapses seem to be induced by some endocrine disturbances coincident with the menstrual cycle. Possibly the high incidence of mitral stenosis in women harks back to the frequent relapses occurring with catamenia. Again, rheumatic fever is characterized by recurrences years apart. In children these are often annual events, in adults longer intervals between attacks are usually encountered. It is not as yet established whether they result from reactivation of a hypothetical virus which has remained dormant in the tissues or from new invasions of the body from external sources, such as apparently occur in patients who suffer repeatedly from lobar pneumonia. It is, however, important to study the conditions that apparently give rise to these recurrences, and with the knowledge so gained to attempt prophylaxis.

Microscopic examinations confirm and extend clinical impressions. All components of the heart show evidence of response to injuries in various stages: the most remote by scar formation and new blood vessels of adult type, and the most recent by foci of fibrinoid degeneration of the mesenchymal ground substance. It is a noteworthy irony of fate that connective tissue which results from healing of the rheumatic lesion is the type of tissue in which the noxious agent is most prone to focalize. Thus the old scars are not only mechanical impediments to the heart but also areas ripe for new rheumatic injury. Thus are formed many layers of connective tissue and elastica in the valves and chordae tendineae and sometimes in the pericardium. The myocardium reveals not only minute old scars, but frequently fresh granulomata, so-called Aschoff bodies, in various stages of evolution and involution. In cases succumbing early in an attack exudative cells may be numerous both in the valves and myocardium. A noteworthy feature of active rheumatic heart disease is the involvement of the cardiac blood vessels, both arteries and veins. True, similar vasculitis is seen in other organs, but in the heart it is an additional source of embarrassment because the diseased vessels are probably less efficient nutritional channels in an organ with tissue concomitantly reduced in efficiency by the rheumatic injury. Furthermore, the scarring of the coronary vessels probably accelerates physiological time for this individual, so that the problems of the aging heart must be met earlier by the person who has suffered severe rheumatic vascular disease.

The pictures just presented are typical of the cases where the disease has run or is running a downward course, either as a result of never having completely subsided, or of repeated recurrences. Except in those rare instances of acute fulminant infection, or where a universally adherent pericarditis mechanically restricts the cardiac action, the permanent and eventually fatal compromising of the cardiac function is a slow process often characterized by repeated attacks of rheumatic fever. At times the infection is so insidious and low grade that the most careful investigation is required to detect its existence. That it is accountable for the final episode in many patients is indicated by the experience of Von Glahn (1927), Rothschild, Kugel and Gross (1934), and de la Chapelle, Graef and Rottino (1934). While the last two groups of observers found active rheumatic carditis histologically in approximately two-thirds of the fatal cases, the incidence of active inflammatory lesions in fatal rheumatic heart disease occurring in the first four decades was 85 and 87 per cent respectively, but in the next four decades it was only 24 and 33 per cent respectively. During these later periods, arteriosclerotic changes, other infections, and cancer were often the causes of death.

Unfortunately, only a few statistical studies of the life history of rheumatic heart disease give detailed information concerning histopathological evidence of recent active rheumatic carditis, obtained from examining six or more blocks cut from various parts of the heart in the manner recommended by Gross, Antopol and Sacks (1930). Too often the statement that there had been only one attack of rheumatic fever rests upon a history concerning arthritis or chorea, for the great frequency of non-arthritic rheumatic fever is still insufficiently recognized. The exudative features of this disease, typically illustrated by polyarthritis, or serofibrinous pleurisy, are relatively early manifestations of an attack, either primary or a recurrence. Later, many patients with subacute or chronic infection show neither these exudative phenomena, nor the toxicity and stormy febrile course so firmly fixed in many a clinician's mind as essential manifestations of rheumatic activity. With cardiac failure, his attention is naturally attracted to the outstanding symptoms of cardiac insufficiency, and he often fails to search long and diligently for the signs of active rheumatic infection. The partial immunity developed by many of these patients apparently so alters their reaction to the noxious agent that the toxic manifestations and febrile course are of a low grade, and the histopathological tissue responses are chiefly proliferative, and exceedingly hard to detect clinically unless they are in the form of subcutaneous nodules. Indeed, it is often difficult to interpret the meaning of a low grade fever in the presence of heart failure because of the tendency of these patients to have elevated temperatures due simply to their inability to lose heat (Cohn and Steele 1934). Therefore, unless we possess some laboratory test indicating specifically the presence of active rheumatic infection, it is essential to have careful histological examinations of the hearts and other viscera of a large series of patients who have died of rheumatic heart disease before we can be certain that active rheumatic carditis is not often an important factor leading to the final episode.

Obviously the disturbed physiological functions conditioned by deformed valves, myocardial scars and adherent pericardium, with the resulting hypertrophy and dilatation, play an important role in reducing cardiac efficiency and abbreviating life. It is interesting that several different observers have found the average span of life of patients with rheumatic heart disease to be 13 to 15 years after the onset of the first rheumatic symptoms (Davis and Weiss, 1931, 1932; DeGraff and Lingg, 1935 a, b, and c; Willius, 1937). Grant (1933) on a more selected material found 19 years; Coombs (1924), 25 years; and Friedberg and Tartakower (1931), 23 years, in a group of 63 patients who had contracted rheumatic fever after puberty, and whose heart disease was discovered accidentally but who never experienced symptoms of cardiac insufficiency.

The figure of 13 to 15 years given as the average expectancy of rheumatic cardiacs after the first attack of rheumatic fever requires certain comments. In the first place, it should be emphasized that half of DeGraff's and Lingg's patients lived longer than 15 years, a quarter of them from 15 to 22, and a quarter from 23 to 49 years. Moreover, these average figures were obtained from subjects living in the North, who had usually come under observation because of symptoms of cardiac disease. In general, they include data from a minimum of patients still surviving, and practically none from those with rheumatic cardiac lesions who have never had symptoms of cardiac insufficiency; i.e., those patients whose hearts were mildly injured during the initial rheumatic attack, but who apparently had completely overcome the rheumatic infection. In general, they do not include a large group of patients—such as those seen by Coombs—who had been carefully observed from the onset of their rheumatic fever to the time of death. The rheumatic cardiac disease of childhood has usually been included to a lesser degree than the relative age-incidence of this disease would suggest as advisable. Moreover, a recent study by Wilson (1937) indicates that this younger group may have a longer life expectancy than is usually considered probable.

DeGraff and Lingg's statement that "after the age of 40 there is a small proportion of sufferers" seems to require qualification in the light of other data. For example, Hedley (1937) by analysing all of the deaths presumably due to rheumatic heart disease in Philadelphia in 1936 found that 45.7 per cent occurred in patients over 40 and about 16 per cent took place in each of the age-periods 40 to 49 and 50 to 59 respectively, a total in the age-period 40 to 59 of 116 (32 per cent) in the 357 deaths from rheumatic heart disease. These differences emphasize the importance of the method of selecting the groups analysed; DeGraff's cases, from Bellevue Hospital, were originally chosen because they had reached the stage in their cardiac career where they had symptoms of cardiac insufficiency from which they subsequently died; rheumatic children who died early as well as those who later did not develop cardiac symptoms were not included. Hedley presumably analysed the records of most of the patients with this disease who had died in a single year in a large city. The geographical situations of the two groups is probably comparable; the Philadelphia group contained a higher proportion of children, and probably of negroes—categories that would tend to weight the figures towards the younger age-periods. Willius (1937) found that among 3418 patients examined at the Mayo Clinic, probably representing a wide area, the largest proportion of his subjects with rheumatic cardiac disease fell in the period between 40 to 49 years, and a fair proportion in the next decade; but it seems probable that few children with rheumatic carditis enter this clinic. Indeed, Hedley found the specific death rates to lie between 23 and 31 per 100,000 for each of the decades between 40 and 79 years, and those for the first four decades to be 10.4, 18.0, 13.7 and 15.3 respectively. If these figures are applicable to the Northeastern Seaboard, obviously rheumatic heart disease is a more pressing problem in the last half of life than has been appreciated; and furthermore, when our population contains a still greater proportion of older people we may encounter a larger number of these patients. Certainly a start has to be made in assembling statistics, but until sufficient data have been analysed to give the picture in various parts of the country and under different social environments it is well to qualify our application of current data to any individual case. Indeed, it is in the nature of statistics not to predict the behavior of the particular from that of the group. It is doubtful whether insurance authorities are as yet ready to name special premium rates for subjects of rheumatic cardiac disease based on present knowledge. The mental anguish of patients and relatives of patients with this malady should be kept in mind when we attempt to base individual prognosis on statistical data; and the gatherers of the statistics already available are much more cautious in applying them than are many physicians and social workers who have simply read their conclusions.

The prognostic import of certain manifestations of rheumatic heart disease is well indicated by the findings of DeGraff and Lingg (1935 a, b, c). The occurrence of symptoms of cardiac failure among their patients, in other words, the passing from functional classification I to II, was a serious sign; for after this event the mean duration of life was five years, with three of these years usually periods of complete invalidism. They confirmed the oft-repeated observation that the valvular disease in itself gives no information concerning probable longevity. Auricular fibrillation usually started late in the course of rheumatic heart disease, and was observed more frequently in those patients who lived longer with their cardiac disease than in those who succumbed early. Cardiac disease in a patient naturally decreases his ability to combat successfully other infections, such as pneumonia. The well-known danger for valves damaged by rheumatic fever to become the sites for implantation of bacteria need only be mentioned to be appreciated; and of the various types of bacterial endocarditis the subacute variety, usually induced by streptococci of low virulence is, by far, the most frequent. In fact, an incidence of from five to ten per cent of subacute bacterial endocarditis in patients with rheumatic heart disease is high enough to remind the physician that he must ever keep this condition in mind as a possible source of fever in a rheumatic cardiac subject, as well as a possible cause of death.

Not having solved the problem of an etiologic agent, we are in a difficult position in respect of specific therapy in rheumatic heart disease. Nevertheless, certain predisposing factors deserve attention, at least in prophylaxis. The high familial incidence can be interpreted from at least two angles: inheritance or environment. By applying genetic analytical criteria to their data, Wilson and Schweitzer (1937) concluded that these patients have inherited a factor transmitted as a single autosomal recessive gene which makes their tissues especially vulnerable to rheumatic injury. Were this the whole story, little could be done beyond trying to breed a race of resisters. On the other hand, data like those gathered by Paul and Salinger (1931) point definitely to the co-existence of upper respiratory infections preceding or during episodes of rheumatic fever and relapsing rheumatic carditis in several members of a family.

Other evidence indicating that some external agent gains entrance to the body is found in epidemics reported by numerous observers,—epidemics which occasionally have occurred among previously non-rheumatic persons, but which more frequently have been observed in convalescent homes or wards occupied by convalescent rheumatic patients; and when the wards have contained non-rheumatic subjects as well, only the rheumatics showed symptoms of this disease. Of course an inherited factor may have been operating; but the precursory influence of the upper respiratory infections practically always observed in these epidemics must be seriously considered. Indeed, by carefully studying the bacterial flora of the nose and throat in several epidemics of upper respiratory infection, Coburn and Pauli (1935 a, b, c) found that only those epidemics in which certain strains of hemolytic streptococci predominated were followed by recurring rheumatic fever. Collis (1931) had similar experiences. Indeed, Sheldon (1931) believes that the contagious factor acts in this preliminary respiratory stage.

These data are in accord with repeated observations that tonsillitis, nasopharyngitis, otitis or sinusitis precede attacks of rheumatic fever in a proportion of cases high enough to suggest a causative relationship. The demonstration of numerous specific rheumatic granulomata in the tissues of the tongue, buccal- and naso-pharynx of patients dying of this disease (Klinge, 1933) indicates the importance of this area in the pathogenesis of rheumatic fever. Indeed, Gräff (1936) claims that some of these lesions represent the areas where a hypothetical virus gained entrance into the body, and designates them the "primary infect." The high incidence of vascular lesions in these same areas points to a pathway whence the blood stream could be supplied with the noxious agent.

While recognizing the possibility of the action of a filterable virus, one is thrown back on the influence of other known pathogens which may be playing an etiologic rôle even though it be not the exclusive one. Among them hemolytic streptococci take a prominent place, although it must be admitted that other infections, sometimes surgical operations and occasionally simple traumata appear to play comparable predisposing rôles.

Certain immune reactions intimately associated with hemolytic streptococcal infections also point to the possible etiologic rôle of these microörganisms. Both the antistreptolysin and antifibrinolysin titres of the sera of most patients with rheumatic fever are high enough to indicate a fairly recent infection with strains belonging to Group A hemolytic streptococci. Furthermore, Swift and Hodge (1936), and a short time later, Coburn (1936), found that many rheumatic patients developed type-specific precipitins against the strain of streptococci infecting them more slowly than did most subjects suffering from hemolytic streptococcal infections not followed by rheumatic fever.

This delayed immune body formation may either be explained on the basis of rheumatic fever being a low grade chronic hemolytic streptococcal infection, or be cited as an example of a poor capacity of rheumatic patients to develop efficient immune reactions in general. In any event, the several immunity reactions confirm the probable significant contributory rôle of hemolytic streptococci in the development of rheumatic heart disease. Hence the desirability of preventing rheumatic subjects from contracting these respiratory infections is obvious.

The social and economic status of most patients with rheumatic heart disease points to the contributory rôle of poor housing, inadequate or improper food, crowding, with consequently greater chance for contact or droplet infection and inadequate domiciliary facilities for the care of the patients during the active rheumatic infection. How often do patients develop a relapse shortly after returning to their usual home environment from a hospital or convalescent home where they have apparently thrived. While the several elements in this complex situation cannot at present be accurately analysed, it seems probable that the falling incidence of heart disease found by Dublin and Armstrong (1933) among the younger groups of Metropolitan Life Insurance Company policy holders is attributable, in considerable measure, to improved economic conditions among the people whence most cases of rheumatic heart disease arise. Incidentally, one prophylactic measure applicable to children with this malady is removal to foster homes where they will receive better care and be less exposed to reinfection than in the environment where they apparently contracted the disease. The New York Heart Association has completed plans for a study of this mode of treatment in collaboration with The Speedwell Society.

The geographic distribution of rheumatic fever and rheumatic carditis must be seriously considered in any extensive public health program having to do with this disease. Not only is its incidence small among the inhabitants of the tropics, but the infection is usually less severe, and shorter in duration, when it occurs in the South. That climatic factors have much to do with these differences is indicated by the observations of Paul and Dixon (1937), who found significantly lower incidence of rheumatic heart disease among American Indian school children residing near the southern border of Arizona than among those living farther north. All presumably belonged to the same anthropological types. The absence of rheumatic fever among poorly housed and inadequately nourished Porto Ricans living in their native environment, even though they are exposed to hemolytic streptococcal infections, and the frequency and severity of the disease among them when they migrate to New York, and are better nourished, are phenomena indicating the great importance of geographic environment. Furthermore, Coburn's (1931) small group of patients with advanced rheumatic carditis, who apparently overcame their active infection when moved from New York to Porto Rico and who again showed active disease after returning to their northern homes, suggested clearly the influence of climatic factors. True, the groups sent from Boston to Miami by Duckett Jones and his associates (1937) did not respond so uniformly well; but one may comment that the constant travelling between the North and Florida of a large public, often moving southward to recover from the effects of colds and bronchitis, results in the inhabitants of Miami being continually re-inoculated with upper respiratory pathogens. Such chances for freshly introducing infections must be considered when investigation of environmental factors is planned on a larger scale, as I feel sure it will be as soon as the problem of studying facilities for the adequate care of patients with rheumatic heart disease is squarely faced.

If rheumatic infection is (as I have elected to regard it) the most important single element in rheumatic heart disease, the aforementioned factors seem to be those most directly subject to more extensive investigation. Why rheumatic fever and rheumatic heart disease should have been so neglected by public health authorities it is difficult to comprehend. More furore is raised over a single case of leprosy than over a hundred of rheumatic fever; and millions of dollars can be raised for the victims of poliomyelitis while facilities for rheumatic cardiacs are woefully lacking. Health officials object to making rheumatic fever reportable because we do not know the etiologic agent or the manner of its spread, and because so many borderline cases render a true picture impossible even were reports required. Except for our knowledge of the virus, exactly the same criticism can be applied to the value of reporting infantile paralysis. One who believes that the reported incidence of tuberculosis represents the true morbidity is sadly deluded; and as for syphilis and gonococcal infections, probably not half of the picture is exhibited. These uncertainties present no valid argument against requiring reports, for only from them is it possible to gain an approximate idea of the size of the problem. Moreover, where geographic factors seem to play a rôle, statistics gathered from widespread areas would have immediate application in framing certain therapeutic measures.

Lack of accurate statistical data is almost as glaring in respect of mortality, because the element, rheumatic fever, is not required in death certificates of patients dying from rheumatic heart disease. We attempt to gain an approximately correct picture by dividing the total cardiac death rates into categories based on presumable age-distribution of the various etiologic types of heart disease, when it is obvious that rheumatic fever is an important contributing cause of these diseases in each of the first six decades of life. It is to the credit of our Bureau of Census that measures have been set on foot to remedy this situation; and if the outline recently presented by Dunn and Hedley (1938) is extensively followed much valuable information should soon be available. Personally, I prefer that the designations "acute" and "chronic" be deleted because they are valueless in indicating the etiologic element which we are anxious to determine, and their use increases the number of reportable categories. If etiological categories are included in the next "International List of Causes of Death," we shall, for the first time, begin to gather reasonably reliable data concerning the economic importance of this disease in many parts of the world. These efforts would naturally reinforce those made by individuals and organizations, such as the New York Heart Association Research Committee, to assemble and analyse statistics, for these models present information which may be compared with that similarly gathered elsewhere. We hope the picture will improve, and we shall be able to measure the change sooner if a fairly accurate base line is fixed now.

Even lacking accurate figures to emphasize the extent of the problem, it is obvious to one who has worked with rheumatic heart disease that the facilities for the proper care of rheumatic cardiacs are woefully insufficient all the way from the early to the late stages. Most cases of rheumatic fever are discharged from hospitals weeks before the infection has fully subsided; and in view of the frequency with which the heart is implicated early, extra strain to which it may be subjected at this time must result in additional scarring of diseased valves and muscle—injuries that will probably collect their toll later. Because of the expense involved in keeping these subacutely or chronically ill patients in wards of ordinary hospitals, this particular problem could be more economically solved by providing suitable sanitoria, now designated as convalescent homes, where the cost per patient is much lower, and where the problems peculiar to this malady could be more carefully studied. So far, special facilities of this sort have been provided only for children. But even these are very insufficient, as anyone can testify who tries to move a rheumatic child from the ward of a general hospital to one of these special institutions; the waiting list is so long that weeks or months ordinarily elapse before the chronically sick youngster can be moved from the ward to a convalescent home. Usually he is sent back to his own home environment, where he contracted his infection; he then attends a cardiac clinic, where he is brought into intimate contact with a crowd of children often suffering from respiratory infections towards which he has no immunity. Re-infection results in additional cardiac damage; and so the vicious cycle continues.

Similar comments are applicable to the average child with rheumatic cardiac disease but without arthritis or chorea. Here the onset of symptoms of cardiac insufficiency usually points to renewed rheumatic infection of the heart; hence the indications would be best met in special institutions like the sanitoria mentioned above. Moreover, I believe a study of sufficient size should be made to determine definitely the effect of climate in preventing recurrences of rheumatic carditis as well as in its cure. This suggestion is not so fantastic as appears on first glance; witness the numerous institutions for the treatment of tuberculous patients, where geographic environment has been the factor determining their location. If victims maimed by poliomyelitis can be sent to Warm Springs to strengthen their muscles, how much more readily would parents of the "cripples who do not limp" be willing to place their children under environments where rheumatic re-infection is less probable, and carditis less likely to progress. What we need are institutions where satisfactory answers to the questions of these parents can eventually be furnished.

As the problems of rheumatic heart disease are not confined to children, suitable provision should also be made for the care of adults with this malady. The organization of special cardiac clinics has improved the situation in part, but it could be more efficiently met by providing institutional care less expensive than that of the ordinary hospital, and with staffs interested not alone in disturbed physiological function but in all of the problems presented by these patients. Here again, proper geographic distribution of institutional facilities seems advisable.

Lest I be accused of over-emphasizing the probable value of institutional care for these patients, let me remark that obviously such care represents only one phase of the problem. In any event, most victims of rheumatic cardiac damage will be in their own homes; hence more effort must be expended to determine the conditions in those homes that favor recurrences of the infection, and where these conditions can be identified, efforts must be made to improve them or to move the patients to more salubrious surroundings. Although most people harbor tuberculous lesions, relatively few have phthisis. Except as a diagnostic aid, and in providing knowledge how to prevent spread of infection, the discovery of the tubercle bacillus has played a minor rôle in the treatment of tuberculosis. Recognition of the conditions under which this disease occurs, and suitable provisions for rest, proper nutrition and favorable environment have been the chief lines of attack. A half-century after the discovery of the tubercle bacillus efforts at specific immunization with this microörganism are still in the experimental stages.

Contrast the inadequate existing provision for cardiac patients with that for the tuberculous in the United States and its possessions (Tuberculosis Hospital and Sanatorium Directory, 1938): 749 institutions with 92,786 beds, and an additional 5,000 under construction or planned. This includes 78 federal, 399 state, county and municipal, 71 private and semi-private institutions. Admittedly, the total numerical pressure for the care of pulmonary tuberculosis is greater than that for rheumatic heart disease; but this is not true for people under twenty, and even though knowledge of prophylactic measures is more exact in the case of tuberculosis, there are still enough points of similarity in the two conditions, at least insofar as concerns resistance to infection, to justify better provision for the rheumatic. It is to be hoped that discovery of a specific etiologic agent in rheumatic fever will lead to specific therapeutic and prophylactic measures, and efforts should certainly be energetically pursued along these lines; but until these goals are reached, we should not fail to recognize the nature of the problem and provide adequate facilities where patients may be properly treated and investigations favorably pursued.

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Part II

The problem of rheumatic fever, difficult and intricate as you have just heard it to be, has, nevertheless, the simplicity believed to inhere in the usual relation of cause and effect. Even if an infection is no longer regarded as an uncomplicated, simple response to a single cause, the range within which the process develops is conceived to be limited to a reasonable number of ascertainable factors. When one turns to the subject of non-infectious cardiac diseases, the difficulties multiply. The very definition of what is a disease becomes the subject of inquiry. But before entering into a discussion of this subject, the ailments about which I must speak should be enumerated. Non-infectious cardiac diseases include for the moment non-toxic and toxic ailments. The toxic ones concern chiefly those originating in malfunction of the thyroid gland, both when it secretes too much and when its secretion is inadequate. I shall be saying little about this group, for although from the point of view of immediate treatment there is much that can be done, from that of natural history their course is so narrowly linked to the defects and course of the behavior of the thyroid gland that the successful management of this may be expected to take care of the reflections exhibited in the behavior of the heart. Fortunately this group is not large. There remain, then, the forms of cardiac disease which so far as can now be told are non-toxic.

These forms are usually designated degenerative, arteriosclerotic or, more recently, senescent. In general, the word *disease* is regarded as adequate to indicate the fact that an abnormal process is involved in these manifestations.

These conditions have taken on unusual importance because of the increase in the number of individuals who are affected. I may anticipate other things which I shall have to say by referring to the fact that the number of persons subject to senescent conditions has been increasing as a direct result of the increase in the size of the population in all the decades after age 40. The increase has in point of fact amounted to 100 per cent. It is small wonder that the number of persons who fall subject to ailments incident to the aging process has, therefore, likewise increased.

The aging process is to be regarded either as disease, or as not disease, and the complaints to which this process gives rise either as natural, and therefore to be expected, or as unnatural or abnormal and, therefore to be regarded as something outside the category of what is normal and, consequently, perhaps as disease. Now there arises a first-rate difficulty when an attempt is made to define not only the word *normal* but also the word *disease*.

If I elect to describe the meaning of the word *normal*, it is because, for my current purpose, to do so opens out significant considerations. The concept of what is normal is one which is not often frankly faced. The evasion is due not so much to a conscious effort to escape a difficulty as to the lack of pressure put upon us to arrive at clarity. There is a simple way of making a test of the meaning of normality. To say that an event or a phenomenon is anticipated is to declare the result of common sense experience. A result is anticipated because a given situation has been frequently encountered and because the consequence of that experience has become thoroughly familiar. Crossing the street in a crowded thoroughfare is accomplished with confidence by a great many persons because the need to do so, and to do so successfully, has been met and solved numberless times. When, recently, the speed of travel in automobiles greatly increased to 50 miles, it was a common subject of discussion that the calculation of how much space was requisite in order to pass another car moving in the same direction required to be reviewed. To accomplish this presented a new danger. But now, after a few years, we have, all of us who drive, gone through this experience with sufficient frequency to know when passing is safe. The dawning awareness concerning these and other similar experiences may be described as statistical inferences. This is what in fact they are.

I have fetched a long circuit in order to introduce the use of this unwelcome word. For I am proposing that the notion *normality* is a statistical notion. It arises from experience with the notion—*health.* Health is a situation, as the result of enjoying which complaints do not arise. It is a common situation. It is a situation in which to function is painless—perhaps allowing for age—effortless. Complaints arise, of course, sometimes unjustly. A man of 70 may complain that he is no longer able to do physical work as once he did, or that he can no longer catch a street-bus, as was once possible. We say to him at once that he is unreasonable, that people of 70 ought not to expect to be able to accomplish these results. When we say this, we have the assurance that in a long series of experiences we have noticed that the experience of the complainer did not differ from that of a host of similar persons with whom we had acquaintance. He behaved in a usual, anticipated manner, and because most people behave likewise, we have come to regard the limitation of his activity as natural and normal. It appears in the light of these reflections that our notion of normality requires extension. It is usual and, therefore, normal, by way of example, for an infant under one year not to walk. It is usual and, therefore, normal for a young man to run. It is usual and, therefore, normal for an old man to be content to amble.

We have next to ask, are there, in connection with these changes in normal ability, changes in the structure of the body which accompany and condition limitations when these appear?

It is not going too far to suggest that this subject has not often been the subject of serious inquiry. To everybody, changes in the surface of the body are familiar. Change in the acuity of vision is a phenomenon with which everyone must deal. Changes in the contour of the head and in the appearance of the skin become inescapable observations. We should, accordingly, not be surprised to learn that if proper search were made comparable alterations would be found in the interior of the body. With a number of these changes, especially as they concern the vascular system, familiarity has been gained from the chapters on arteriosclerosis in the volume edited by E. V. Cowdry.* It was astonishing to learn not only how many such systematic changes are already recognized, but also about how little is known, in a systematic way, and how little attention has been devoted to investigation, of the mechanisms which underlie these changes.

It is, for example, well known that the elasticity of tissues and organs changes in the course of time, as in the eye and in the aorta. And it is known also that the appearance of the aorta, and of the eye too, alters with time without relation to recognized, special causes. It is not quite satisfactory to link too closely the superficial anatomical change in the aorta with the functional situation, for it is not certain to what extent the obvious arteriosclerotic process there encountered depends on decrease in its (the aorta's) elastic property, more especially

*Arteriosclerosis; a Survey of the Problem. N. Y., Macmillan, 1933.

since there is no good reason to suppose that the quantity of elastic tissue has decreased. The change, it is not unreasonable to suppose, takes place in the intimate nature of elastic tissue, but whether this is true, and in what way the change is to be analyzed, has not been the subject of adequate investigation. I am, of course, not ignoring those researches which have demonstrated that the velocity of waves over arteries increases with time. This occurrence is a demonstration of change, but not an analysis of this change. If I single out elasticity for special comment, I do so because this is a property, but naturally not the only one, on which the behavior of tissues and organs appears to be very dependent. If it can be shown to change systematically with time, an analytical approach in a specified important direction will have been found. Investigations dealing with such matters do not so far seem to be numerous.

I have been discussing certain conceptions concerning health, normality, experience, and statistics. I meant to suggest by inference that the notion *disease* is of something unusual and un-anticipated, and that ill-health and disease are recognized as a consequence of experience—partly empirical and partly rational; empirical because of our daily observations of fact; rational because of our effort to range experience in an accepted pattern. The question now arises—are all complaints associated with defects in the circulation and in the behavior of the heart to be regarded as disease or as the result of something concomitant with the process of aging? It must be obvious it is my notion that certain of the conditions with which we are familiar are not to be regarded as disease but as normal occurrences. To make this distinction is not idle, but has as a consequence an altered view of the support that can be offered in coming to the relief of those who suffer from disability. It makes a difference whether research is directed towards altering and curing or towards facilitating and relieving. It does not necessarily mean that an effort should not be made to slow the senescent process so as to prolong to a maximum the period of active, productive living; nor does it mean that the effort should not be made to see whether mechanisms cannot be modified on which growth depends in complex organisms like ourselves. To accomplish these ends lies naturally in the future, if they can be accomplished at all. But in the event that they cannot be, something more immediate, something urgently useful is wanted. It may be worth saying that not only matters of anatomy and of physiology and of therapeutics are involved, but matters affecting the public organization for maintaining health, not only hospitals, convalescent homes and clinics for the care of those whose circulations are disabled, but also arrangements looking toward the ability of older persons to keep themselves occupied and perchance even to accomplish their economic self-sufficiency.

The entire community has in recent years become alarmed at the increase in the number of persons afflicted with long drawn out, and perhaps even more alarmed at the apparent increase in number of acute, circulatory derangements. The situation has been confused so that proper inferences could not be drawn on the meaning of the obvious occurrences. It took some time to arrive at the notion that the reason for the increase was that the older population is increasing. And yet increase in number does not necessarily mean increase in rate. If the number of cases doubles, and also the size of the population, the rate would naturally remain unchanged. That means, of course, that the alarm which has been widespread is unfounded, unless the rate rises conspicuously. And even then, another factor is operative. It took time to appreciate the fact that the decrease in the number of cases afflicted with infectious diseases was sharply falling and was giving rise to the larger size of the older population. But that is not all; at older ages, as at younger, infectious diseases themselves were declining so that a corresponding rise in the rate from such ailments as cancer and circulatory diseases must be anticipated. To die so, is the price we pay for our longer lives.

Now numbers are important things in themselves. The larger the number the worse the general situation. But it must be obvious that it is not a comparison between numbers afflicted in 1938 as against 1900 that is important, but whether at the same age, among a certain number of people at these two dates, more individuals are suffering now than did so then. It has been difficult to make such comparisons because while these changes were taking place other changes were taking place also in the methods, conceptions, and fashions in diagnosis. It becomes necessary, therefore, to keep an open mind on whether these ailments of which we are speaking are increasing. To make unsupported assertions on acceleration in the pace of life seems idle. It will be necessary to await the slow passage of time before concluding what consequence our method of living has on the duration of the subsequent period of our lives.

It becomes necessary, meanwhile, to investigate more closely the nature of the processes which underlie cardiac and vascular change. Something is known, of course, of the fact that the muscle of the heart undergoes alteration with time, but it is not known to what extent such alterations are associated with nutrition, including in the notion *nutrition*, both the usual food-stuffs and vitamins. The matter of diet may turn out to be of profound importance. It is already clear from much general experience, from the Report of the Committee of the League of Nations on Nutrition and from the experience of American anthropologists, that diet and environment play telling rôles in bringing about changes in stature, even in the same races at home; and when members of a race, Chinese, African negroes, Hindus, for example, find new domiciles elsewhere, important alterations have been noticed. Nor can the possibility be dismissed that in the structure of organs and of tissues comparable modifications likewise occur. And so, just as diseases result from deficiency in certain food-stuffs, in a more general sense alterations may take place having consequences for the life histories of the heart and blood vessels. It is known also that the arteries, great and small, undergo changes, but it is not known, either to what extent these changes are reversible or in what manner they are dependent upon the external and the internal environments of the body. It is, of course, clear that they undergo usual changes. But it is not yet clear whether these can be classified according to different etiological or topographic associations. It is a strange circumstance that in the same heart, for example, different branches of the coronary arteries present, usually, different stages in the development of the lesions commonly found in them. The ramus descendens posterior, so far as such experience goes, is, it appears, ten or more years younger than the anterior descendens. Nor is it clear why a curious lesion which affects the descendens anterior about one centimeter from its origin passes through precisely this evolution. Nor is it yet clear in a mechanistic way precisely what this evolution is. As I have said, these are matters which are obscure both etiologically and topographically. What it is important to know and to learn in respect to the vessels of the heart should be spread to include also the arteries of the kidneys and the brain. These are the least silent organs of the body.

It is well known that about 25 years ago the general subject of cardiac diseases became a matter of public concern. So far as I know the Association for the Prevention and Relief of Heart Disease in New York, organized originally in 1915, and reorganized in 1919, after the World War, was the first formal body to concern itself with the problems presented by the large number of persons subject to circulatory and cardiac ailments. It is not without its lesson to notice that before many years elapsed it seemed circumspect to change its title to the simpler *New York Heart Association*. This change was incident to an appreciation of a shrinkage that was taking place in the amount of knowledge that it was supposed was possessed of affections of the heart and blood vessels. The numerical distribution of the various cardiac diseases was scarcely understood. In point of fact, everything was called Heart Disease. That situation turned out to be unsatisfactory. An investigation at the Bellevue Hospital Cardiac Clinic in New York laid the foundation for studies designed to clarify this situation, at least in the United States, and probably elsewhere.

At first it was necessary to range the cases under a large number of rubrics until it became apparent which of them had significance. It was clear that the two outstanding varieties were rheumatic and arteriosclerotic. As time has gone on it still appears that these two represent the main varieties. What was not at all clear was what a person suffering from either of these forms could expect to be the course of his life. As the result of the study of many thousands of cases in this part of the world, it is now apparent that rheumatic fever may be regarded as, relatively speaking, a youthful disease. We have had the opportunity of analyzing almost 2500 cases studied in the cardiac clinics in Philadelphia. Here events duplicate an experience of Wyckoff and Lingg in New York. Though between 65.5% (male) and 75.9% (female) cases attended clinics before age 40, it is known that these represent not more than one-sixth or one-seventh of all cardiac cases. The explanation offered is that either the old do not find going to clinics valuable or that, for whatever reason, they go to hospitals. I may say here that we regard as very important the opportunity of analyzing this collection of Philadelphia case reports and are grateful for the opportunity that is offered us in doing so. It will before long, as the result of the analysis of some 20,000 cases on which there are good records in New York, be possible to say at what average age the onset of this disease takes place. It will also become possible to say a little more exactly than can be done now how long this disease usually lasts, how long patients can remain economically independent, and for how long a period they must be cared for in clinic or in hospital. Concerning the senescent form it is impossible to be so precise. It is almost in the nature of the case that the onset is difficult or impossible to date, and under these circumstances it is difficult or impossible to arrive at a just notion of the durations of the various phases of patients' disabilities. It is desirable, nevertheless, from several obvious points of view to attempt to find a closer approximation to the durations of these periods than is now possible. For this reason the accumulation at first of a reasonably large, and then of a very large, number of cases falling into appropriate categories is desirable. Whether in persons who are the subjects of arteriosclerosis important differences in the nature of the process occur, and how these are to be classified fruitfully, is an investigation practically untried. The material has not been utilized, even if it is available. But it is quite conceivable that sex determines differences in the development of the malady and that the lesions reflected in the behavior of the blood pressures may disclose a variety of types. A clue to such changes may be found in the study of the pulse pressure. The rate at which the height of the pulse pressure increases may suggest differences in the nature of the process. With a study of varieties of cases like these as a basis, an insight now seemingly impossible of attainment may be achieved, so that a more satisfactory description of the course of events is available. To achieve a satisfactory result may not be more difficult than the accomplishment which has attended the study of many another phase of this complex situation.

For this purpose a further development of the idea of the cardiac clinic may be necessary. The effort is being made now in New York, in at least two clinics, to develop greater insight in the natural history of arterial hypertension and arteriosclerosis. The experience in these clinics may serve in a preliminary way, as in the past, as a bellwether for other similar institutions. Among matters of more nearly medical interest the histories of cases of cerebral apoplexy, of thromboses of coronary arteries, and of renal malfunctions may be studied, as well as of complaints referable to the peripheral blood vessels.

These preliminary remarks have been made to indicate what factors play a rôle in understanding long drawn out cardiac affections from the viewpoint of the public health. But a statesman whose concern is the health of citizens must take into consideration still other elements. He must know, as has been said already, how large this problem is numerically. The larger it is, the more urgent, of course. He must then learn whether such maladies can be prevented, cured, or stopped. But before he can ask questions relevant to this problem, he must ask anterior ones, to which reference has already been made. He must ask, if such ailments can be prevented, is there anything he can do to bring about so happy a result? In the light of current approaches to such problems, he will ask whether the cause or causes of these ailments are known. He will be told that there are causes—not *a* cause. He will be told of the rheumatic and toxic forms—but enough has been said already concerning them. He will be told also of general arteriosclerosis as occurring in three main forms at least, and as being chiefly responsible for senescent cardiac disabilities, affecting predominantly, as they do, the muscles, the valves, and the arteries of the heart. He will ask about arteriosclerosis—what attitude must, or can, be taken in respect to it. He will be given several answers, depending on the state of feeling or the state of knowledge of his interlocutor. He will be told that arteriosclerosis is a result of behavior, of ecology, that is to say of environment and of food variety and food supply, nutrition in short, or of growth and progressing desiccation.

There are many serious men who believe there is something in the pace of life, in our behavior, which disposes us to the development of this state. For the moment, each one of us is entitled to his view. To be frank, I prefer to say I do not know. The subject is of such importance it would pay to ascertain the facts. And there are, of course, various ways in which knowledge of this matter can be gained. He will be told that diet somehow determines the onset of this condition. As is well known, many experiments have been performed in animals to show that by means of special articles of diet, the sterols for example, changes in their arteries can be brought about. Very recently the attempt has been made to follow the intermediary metabolism of substances by ingenious ways, with heavy isotopes, and to search out their fate in their passage through the organs of the body. These are important studies from which new insights may be expected. There is a third view, that the mechanism of growth underlies the appearances of arteriosclerosis—that its occurrence is dependent somehow on the joint enterprises of the body as a whole—that its occurrence comes on with years, that it is, as I said in the beginning, a normal phenomenon.

It is important for a statesman to press on to learn which answer is correct. If the first two, the psychological and the ecological ones, are correct, he would conclude that some method could almost certainly be devised which would assure us means of controlling our fate. It is possible, for example, that our psychological energies can be directed to flow in fruitful channels; or that improper diets can be exchanged for proper ones. These are hopeful views. It is not desirable to analyze such possibilities further, for requisite information is not available. But in the third, according to which the process is that of growth and is inevitable and irreversible, he would decide that relief and melioration alone are possible.

These remarks have all issued from the idea that senescent cardiac affections depend for their emergence on affections of the arteries—conventionally called arteriosclerosis, whether muscles, valves, or arteries are at fault. But this need not be the case. Changes in the arteries alone need not be the determining forces. Deterioration may result from processes entirely different. But, for the time being, no knowledge of such mechanisms exists. We adopt the view, in all probability prematurely, that all hangs on what occurs to the arteries, though we know that changes occur in elastic tissue, in muscle itself, and in the arteries—changes which may be designated as intrinsic to these structures. But there we must leave the matter.

You may say that this discussion escapes the realities of the situation—that what I should be speaking about is thromboses of coronary arteries, syphilitic aortitis, connective tissue changes in the cardiac walls, so-called myocarditis, and heart block, as well as other cardiac illnesses. My answer is that a thing can be recognized as such, *Das Ding an Sich.* To that end, in the past 20 years, as I have shown, a persistent and carefully directed effort has been made at improvement in the classification of such conditions. We are, even in this direction, far from the end of this enterprise. But recognizing them is not enough. An understanding of these conditions depends on the analysis of them, especially if we intend, on grounds not too wildly empirical, to modify unwanted situations so that disabilities may be prevented from taking place. It becomes necessary, therefore, to search for causes, for processes, for mechanisms, or at least for factors, relevant to and determining these states, interference or modification of which alone opens a pathway for the application of appropriate, meliorating remedies.

Elasticity, colloidal behavior, desiccation, the togetherness of the organism, growth, nutrition, seem a long way away from a proper discussion of "cardiac diseases" in relation to the public health. But I hope to have suggested that this is not so, that what our subject requires, if we are to make progress in its management, is a more profound insight into its meaning, its origin, and its physiology. In the light of further knowledge, what it is possible to do should emerge.

A. E. C.

Should Psychoanalysis Be Purged?*

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I

LONG since, the word purge has escaped the confines of its intestinal significance. It is now used more generally to indicate the removal of undesirable and inconsistent elements not only from the individual, but from an organization, from a political system or from an ideology. It is the premise of these remarks that psychoanalysis should be purged.

It would be an impertinence to the composite ego of this audience to explain in any detail what is meant by psychoanalysis. It is at once a psychology, a philosophy and a method of treatment. As a treatment technique it is applicable chiefly to neurotic and mental disabilities. In this field, psychoanalysis scarcely could have a higher or nobler objective. It endeavors to free the patient from the fetters of the neurotic inhibitions, repressions and disabilities which were forged in his childhood and which bind him fast to parental dominance or its surrogate. It shows him how to attain emotional maturity. It attempts to lead the neurotic cripple to a promised land, where he will become emotionally straight and strong and where, it is hoped, he will be able to live life on equal terms with his fellow men.

In order to reach this objective, psychoanalysis explores that mental "No Man's Land"—the Unconscious. The geography and contents of this country are beyond the horizon of the consciousness of the patient and the trails which the psychoanalyst follows in the journeys through this territory have very faint markings. The exploring psychologist takes his bearings mainly from the intellectually unsupervised or "free" associations of the patient and from his dreams. The important trails are the back

* Read before the College of Physicians of Philadelphia, November 2, 1938.

trails, the straggling lanes and dark by-ways leading to the childhood and infancy of the patient. Indeed, they are penetrated much farther than this and traced back into the very womb of the mother and even beyond into that dim, shadowy jungle where long before the dawn of recorded history our prehistoric ancestors were struggling tooth and nail to retain a precarious hold upon the ledges of evolution.

Naturally, before undertaking such a gigantic task, it was necessary to do a prodigious amount of study and to engage in an even more prodigious amount of interpretation and speculation. Psychoanalysis had a very humble beginning. Great projects often do have very humble beginnings, but lowliness of origin alone is not necessarily a hostage for future greatness.

In a very small way, psychoanalysis began with the combined hypnotism and analysis of a single patient, Anna, by Breuer, an associate of Sigmund Freud. Freud did not actually treat the patient, Anna, but became extremely interested in Breuer's work and reviewed and interpreted it. During the course of the treatment, Breuer became upset because the patient fell in love with him. At this early day he did not realize that this was merely a manifestation of the psychoanalytical mechanism now known as *transference* and regarded as an inevitable stage in the analysis. The patient is analyzed through the transference just as he is analyzed through his other symptoms.

Anna had major hysteria marked by many severe symptoms, including speech difficulty, paralysis, visual and hearing defects and nervous excitement. In hypnosis, Breuer traced back the symptoms and discovered that when the patient arrived at the particular experience which had been present when a symptom appeared, then that symptom disappeared. Subsequently, Freud in his early lectures made the following interesting remarks:

> The doctor soon hit upon the fact that through such cleansing of the soul more could be accomplished than a temporary removal of the constantly recurring mental "clouds." Symptoms of the disease would disappear when in hypnosis the patient could be made to remember the situation and the associative connections under which they first appeared, provided free vent was given to the emotions which they aroused. There was in the summer a time

of intense heat, and the patient had suffered very much from thirst; but, without any apparent reason, she had suddenly become unable to drink. She would take a glass of water in her hand, but as soon as it touched her lips she would push it away as though suffering from hydrophobia. Obviously for these few seconds she was in her absent state. She ate only fruit, melons and the like, in order to relieve this tormenting thirst. When this had been going on about six weeks, she was talking one day in hypnosis about her English governess, whom she disliked, and finally told, with every sign of disgust, how she had come into the room of the governess, and how that lady's little dog, that she abhorred, had drunk out of a glass. Out of respect for the conventions the patient had remained silent. Now, after she had given energetic expression to her restrained anger, she asked for a drink, drank a large quantity of water without trouble, and woke from hypnosis with the glass at her lips. The symptom thereupon vanished permanently.

Anna had spent years sharing with her mother the devoted care of a sick father.

Once she was watching at night in the greatest anxiety for the patient, who was in a high fever, and in suspense, for a surgeon was expected from Vienna, to operate on the patient. Her mother had gone out for a little while, and Anna sat by the sick-bed, her right arm hanging over the back of her chair. She fell into a revery and saw a black snake emerge, as it were, from the wall and approach the sick man as though to bite him. (It is very probable that several snakes had actually been seen in the meadow behind the house, that she had already been frightened by them, and that these former experiences furnished the material for the hallucination.) She tried to drive off the creature, but was as though paralyzed. Her right arm, which was hanging over the back of the chair, had "gone to sleep," become anaesthetic and paretic, and as she was looking at it, the fingers changed into little snakes with death's-heads. (The nails.) Probably she attempted to drive away the snake with her paralyzed right hand, and so the anaesthesia and paralysis of this member formed associations with the snake hallucination. When this had vanished, she tried in her anguish to speak, but could not. She could not express herself in any language, until finally she thought of the words of an English nursery song, and thereafter she could think and speak only in this language. When the memory of this scene was revived in hypnosis the paralysis of the right arm, which had existed since the beginning of the illness, was cured and the treatment ended.

II

The tiny seed of the interesting case of Anna fell on fertile soil, took firm root and soon attained a lusty growth. Now it is a wide-spreading tree with enormous psychological, philosophical and technical branches. From time to time, grafts were taken from the tree by former disciples of Freud, planted and carefully nurtured and tended. The results bear very little resemblance to the parent tree and are scorned by the Freudians as rank* and weedy growths.

Without prejudice to the brief of those who are in opposition to the doctrines of Sigmund Freud, it should be freely stated that definite benefits have accrued from psychoanalysis. Among many psychiatric dividends, at least three should be memorialized. They may be summed up in the statement that Freudian psychoanalysis was, and in some sense continues to be, an antidote against what might be termed the objectiveness and the puritanism of psychiatry; and, furthermore, it acted as a corrective to the taciturnity that conservative psychiatrists imposed upon their patients.

Less than three decades ago, psychiatry had climbed to the very Mt. Everest of its descriptive epoch. The student could read page after page of beautiful and accurate descriptions of the symptoms of nervous and mental patients. All the phenomena of mental and nervous diseases were meticulously and exhaustively delineated and classified, but with scarcely even a cursory hazard as to *why* the patient had this or that particular symptom.

Why did this man pull down a forelock of his hair and assert that he was Napoleon? Why did that woman believe she was the Virgin Mary? Why did this neurotic patient concentrate all her attention on the normal sensations arising from the digestion waves of the stomach and intestines, to the exclusion of her husband, her children and all other non-digestive interests? Why was that important business executive unable to sleep until he had carried out a complicated and tedious ritual of placing his clothing in a *certain* way, on a *certain* chair, turned in a *certain* position in his bedroom? For these and similar questions objective psychiatry had no satisfactory answers.

At once, psychoanalysis led an assault against the citadel of self-sufficient objective psychiatry. It demanded that there be an inquiry into the subjective aspects of both the patient and the symptoms. In effect, psychoanalysis said, and said wisely, that

* The pun is unintentional.

much more important than the mere description of the symptom, was the attempt to uncover in the obscured mental life of the patient, the starting point and the reason for the symptom. For instance, psychoanalysis was bored at the careful word picture of the patient who curled up into a shape much like a ball and promptly returned to the position of flexion of head, body and limbs, no matter how often the nurses straightened her. The "new" psychology scrutinized the patient subjectively, and with more or less authority derived from the study of other patients, from its own psychology and from borrowed sources hazarded the opinion that the position of the patient and her determination to retain it were expressions of an unconscious wish to be freed from the strife, turmoil and coldness of the world and return to the peace, quiet and warmth of the womb of the mother.

Before the advent of psychoanalysis the discussion of sex, its developmental stages, its incompletions, its deviations and, in general, its importance as a dynamic factor in the production of nervous and mental disorders, if not exactly taboo, nevertheless, was much more honored in the breach than in the observance. Psychoanalysis insisted emphatically that its studies indicated that sex was of the utmost importance and to ignore its influence was both stupid and dangerous. Thereupon it focussed upon sex in all its ramifications a penetrating and revealing battery of phylogenetic searchlights. Critics of psychoanalysis are wont to declare that psychoanalysts became too absorbed in what they felt the searchlights revealed. They say the psychoanalysts were blinded by the glare and became myopic for non-sexual vistas. Nevertheless, it is true that the dark places of sex needed to be illuminated.

In pre-psychoanalytic days the neurotic patient was not much encouraged to talk. By and large, he was required to be silent and listen to the psychiatrist. Psychoanalysis loosed his tongue. It not only encouraged him to talk, and to talk freely, but it gave him carte-blanche to say anything he wished. Anti-psychoanalysts insist that the patient talked entirely too much; but there is little doubt that the net result was good, just as there is little doubt that very frequently in the practice of the

Catholic confessional enormous psychological benefits are resultant upon the outpouring of the troubled and burdened mind.

III

With numerous trained workers industriously cultivating every field that might have any bearing on psychoanalysis, not overlooking even myths, folk-lore, fairy tales and nursery rhymes, it was to be expected that an enormous structure of hypothesis would be erected. This has happened. Truly the structure of theory is mountain high. Many critics think it is much too high. They think it contains too many towers of conjecture, and too many wings built hastily and flimsily without the precaution of putting down secure foundations. They think there are too many symbolic gingerbread adornments. Furthermore, they deplore the fact that the Freudians have devised a language of their own in order to designate various parts of the hypothetical structure. They claim that this language is unnecessarily weird. They say phrases like "polymorphous perverse," or "Oedipus complex," or "death wish," sound interesting and provocative, but, in reality, are quite deceptive, since they result from the fallacy of mistaking a part for the whole. In other words, they are willing to grant the occurrence of an Oedipus complex now and then, but assert that an occasional Oedipus complex no more makes a credo than a swallow makes a summer. They do not, for example, object to the infant being labelled "polymorphous perverse," or for that matter, bewhiskered pollywog, if it can be demonstrated that the appellation validly and fairly constantly describes the baby. They do not think it does. They propose that the theory of psychoanalysis should be purged of its trivialities and excesses.

Again without prejudice to the argument of anti-Freudians, it is fair to note that a hypothesis should not be hampered too much in the development of its theory. If it is sound, it will learn to trim off its over-elaborations and survive. If it is unsound, it will fall by its own weight. Much more important is it, that it should not abort its natural development by presenting theory as fact. Many observers would say that the reason psychoanalysis is tripping about so awkwardly in its long pants is that, as knowledge is measured, it is still in the knickers stage. It is my conviction that psychoanalysis does not need to be purged in its theory nearly as much as many psychoanalysts need to be purged of the belief that the mere utterance or writing of a psychoanalytic thought at once and miraculously transforms it into scientific fact. The printed or written word may be very fallible, and scientific truth is not necessarily born even when the labor of words comes from the lips or the pen of the great Viennese teacher.

It is this insistence upon the acceptance of theory as fact that has brought about an alarming cleavage between psychiatry as a field of medical endeavor and psychoanalysis. Many signs portend that, if the decree of divorce has not been actually signed, certainly the stability of the union of medicine and psychoanalysis is seriously threatened. Each department and speciality of medicine speaks its own language, and when the members of a group meet professionally, they converse with each other in the language of their specialized medical interest, whether it be gynecology, pediatrics, otology, radiology or what not. But over and above this, there is a common language which is readily understood by all medical men and which is constantly spoken in the discussion of the very numerous points of contact between each speciality and the broad field of medicine. Psychoanalysis speaks this language very haltingly.

Furthermore, and more important, there is a more or less universal pattern of medical thought concerning the scientific requirements needed before a mere theory may be held and taught and practiced as fact. All in all, these requirements are rather exacting and there are many skillful devil's advocates who make it their business to see that theories are not hurriedly and improperly canonized into facts. This is as it should be. The implications are rather serious. Not infrequently human life is at stake.

Psychoanalysts do not seem to realize that at least a few scientific steps must be taken before one may pass from the level of theorizing—"it may be so, we think it is, but much more study is needed"—to the higher plateau adjoining the land of medical fact, where it is permissible to declare—"I am ready to assert that my conclusions are correct, because—". This tempered attitude of true science, perhaps, is aptly expressed by the words which Sinclair Lewis had Martin Arrowsmith write in his note-book at the conclusion of long, arduous and exhaustively checked research in his laboratory: "I have observed a principle, which I shall temporarily call the X principle, in pus from a staphylococcus infection, which checks the growth of several strains of staphylococcus, and which dissolves the staphylococci from the pus in question."

In "Arrowsmith," Lewis's hero-scientist had made a monumental discovery and the exact and cautious words with which he described it conveyed the correct attitude of real science and the true scientist. The counterpart may be found on every page of the annals of medical discovery.

Is this the attitude and are these the words of psychoanalysis? It is not and they are not. The merest theory is announced with all the positiveness and authority of an ex cathedra pronouncement.

Some time ago, there came from Vienna the hypothesis of the so-called death wish. In effect, it assumes that running along concurrently with the wish to live and love there is the desire to die. At once, the disciples of Freud accepted the theory as proven fact. In a book recently published, the conflict between Eros and Thanatos is graphically described, and without dissenting or even controversial voice there is the calm acceptance of the sweeping belief, that not only suicide but neuroticism, alcoholism, criminalism, mental disease, malingering, a certain segment of surgery, impotence and frigidity and even physical disease are all expressions of the death wish, valid examples of suicide!

Naturally, psychological medicine cannot be subjected to the same rigorous criteria as the more physical and concrete researches. There are no bacteria, or filterable virus, or anti-bodies or immune sera or chemical tests which may be applied to experimental animals in order to determine if they will produce more or less constant reactions. Nevertheless, even psychological medicine has its checks and balances. Seemingly psychoanalysis is either unable or unwilling to accept even very flexible criteria. Voluminously, if not convincingly, it continues to describe even the most speculative theory as shining, golden fact. Consequently, there is little interchange of opinion between psychoanalytic and non-psychoanalytic groups. There seems little likelihood that either side will be willing to condone the "offenses" of the past, and so it is likely that medicine and psychoanalysis will be separated by a final decree of divorce. Perhaps psychoanalysis needs to be purged of some of its credulity— and the purge might be followed by several doses of scientific agnosticism.

It is only fair to recall that the libel for the original bill of divorcement was not filed by the psychoanalysts. Many years ago, I attended a symposium on psychoanalysis sponsored by a national psychiatric society. The symposium was not very edifying. Professors, ordinarily grave and dignified, attacked the psychoanalysts with everything but their fists and their intelligences. It was an emotional débâcle. For a few years, similar emotional orgies became the order of the day, but gradually they became less common and finally ceased altogether, possibly because they accomplished nothing and were bad for the blood pressure.

Unfortunately, calm, orderly and productive discussions did not replace the wordy, emotional debauches. There are few, if any, discussions between analytic and completely or partially non-analytic groups. How could there be? Theory is presented as fact by the analysts and, if the non-analysts object, they are told that their objections indicate "resistances," probably grounded in unresolved complexes dating back to childhood, or else they are informed that unless they have been personally analyzed they cannot expect to understand. In this connection it might be pointed out that eminent obstetricians are almost all members of the male sex.

In any event the fissure between psychiatry and psychoanalysis grows wider and wider. If the original divorce libel was framed by the anti-analysts, it would seem that a counter libel alleging lack of understanding and medical cruelty has been drawn up by the psychoanalysts. Therefore, divorce seems to be inevitable. A court of medical judgment will scarcely be able to disregard a thoroughly tested law which insists on honest scientific agnosticism until the case is proven. It is regrettable, since each side stands to lose something.

IV

Is psychoanalysis inconsistent in its practice? I think it is. I am not referring to minor inconsistencies, like the somewhat naive belief that there is no power of suggestion to the patient in the technique it employs. In an orthodox analysis, the patient reclines on a couch, the light is subdued and the analyst is outside the range of vision of the patient. Could there be a more perfect stage setting for the operation of suggestion? But this and other minor details do not constitute significant inconsistencies.

In my mind, there is a graver inconsistency which strikes at the very vitals of Freudian psychoanalysis.

A fundamental element in Freudian psychoanalysis is the imperative need of teaching the patient how to sever the Silver Cord which binds him to the past.

The patient is neurotically disabled because emotionally he is still tied to the authority of his childhood. He has never grown up because he has never been able to attain emotional independence. Therefore, in his emotional life, his parents have been succeeded by a procession of self-imposed parental surrogates and he has remained inferior and insecure in every relation of life. Blindly he continues to react to the pattern of his childhood submission and dependency. Enormous inner conflict is engendered and, finally, various neurotic symptoms come to the fore and engage his attention. Let us assume that he seeks the help of the psychoanalyst.

The skill of the analyst enables the patient to bring up from the murky depths of the unconscious a vast quantity of wreckage. The patient is made to survey the flotsam and jetsam which marks the wreck of his life, due to his failure to break away from the parent ship and float his own craft. If he has been successful in "working-out" on the analyst the emotional blocks of his early life, then, at last, he is free. Obviously, in his newly acquired freedom his first thought should be, never again to become enmeshed in the snare of emotional submission to authority. He is now independent! Henceforth he will think and act for himself, and nevermore will he obey unreservedly and blindly.

Now, I put this question: Does not the analyst himself submit to an authority which certainly has strong emotional components? If he is an accredited analyst, he has been analyzed and has freed himself from the entanglements of emotional bonds. He has learned the technique of practice. He follows it rigidly. It is the rule of his daily professional practice and, if he is orthodox, he does not deviate from it by the fraction of an inch.

Whatever his professional troubles may be, and doubtless they are many, he should not be troubled by any great concern as to the wisest course to pursue. The course has been carefully mapped out for him and he has acquired the skill to follow it. In the practice of medicine and psychiatry the situation is somewhat different. The problem presented by each patient must be judged on its merits. Usually there is no dearth of things to do, but mature deliberation is needed in order to make a wise selection of treatment. Two patients with the same illness may need different techniques of treatment. Environmental situations may determine treatment modifications. In a few words, there cannot be a universal technique.

Of course, there is no implication that medicine is invariably practiced in such an intelligent manner. There have been frequently in the past, there are now, and there will continue to be in the future, in the practice of medicine as well as in every other field of human endeavor, the exhibition of fads and even whimsicalities, and the drive of emotionally cherished beliefs.

There is, for instance, the theory of focal infection. A focal infection is an infection at some point within the body, perhaps in the tonsils, at the root of a tooth, in the gallbladder or in other places. Unquestionably, there is a relationship between such focal infection and certain types of neuritis, arthritis, St. Vitus's dance and a few other conditions. The observation and substantiation of this fact led some enthusiasts to ascribe all human ailments to focal infection. They became focal infection conditioned. One physician, a psychiatrist to boot, went so far as to insist that *all* mental disease, *all* feeblemindedness, and *all* criminalism was due to focal infection!

Then there is the ductless gland theory. Now, the ductless glands, the thyroid, the pituitary, the ovaries and others *are* enormously important in the functioning of the human economy. Occasionally brilliant results are achieved by the administration of the gland substance that is lacking. There are certain instances of feebleminded cretinism in which the giving of thyroid gland is followed by rapid and notable physical and mental improvement that is little short of miraculous. It is scarcely surprising that, having witnessed such near-miracles, some medical men were swept away from the moorings of intelligence and began to see ductless glands in all the ills that flesh is heir to, from measles to brain tumor. They became ductless gland conditioned.

Why did the adherents of the focal infection theory, and likewise the followers of the ductless gland hypothesis, lose all sense of perspective and in the first instance indict focal infection, when it either could not have been causative or did not even exist at all; while in the second instance insufficiency of this or that ductless gland was diagnosed when, as a matter of fact, the entire ductless gland system was hitting perfectly in all cylinders? If intelligence could have had a calm and dispassionate hearing, such obvious mistakes could never have been made. The focal infection and ductless gland enthusiasts were carried on and on by the tremendous wave of emotional belief, which drowned out the feebly flickering protest of intelligence. Naturally their conclusions concerning the rôles of focal infection and the ductless glands in disease were grossly in excess of the premises. Very readily they became victims of the fallacy *of mistaking a part for the whole.*

There is good reason for the belief that psychoanalysis has tricked itself into the same error. Many of the situations it describes unquestionably are valid—*sometimes.* This has produced a kind of eagerness to believe that they are always true. With boundless energy, supporting odds and ends have been garnered from near and far, even from very remote outposts of science, from etymology to archeology, from the tragedies of ancient Greece to the Mosaic law. These odds and ends of information have been skillfully contrived into a pattern into which are woven the problems of the neurotic of this day and age. Thus, it has been suggested that the wife who dreams of performing the sexual act with her husband while she is menstruating is unconsciously desiring his death, since according to the Mosaic law and other ancient codes of hygiene the menstruating woman was not only regarded as unclean but as poisonous and was forbidden to touch crops and other growing things. In like manner has the ancient tragedy of Oedipus Rex been borrowed, in order to trace back a neurosis in adult life to an early unconscious incest wish in the child for the parent of the opposite sex and a death wish for the parent of the same sex.

Thinking that is emotionally motivated has warmth and momentum and is often very useful thinking, but in science it should be employed sparingly and with the greatest caution.

Emotional thinking has certain distinguishing marks. For one thing it makes enrichening associations with the greatest ease. All is grist that comes to its emotional mill. In intellectual thinking there is only a small leaven of emotion and each association must be carefully scrutinized and authenticated before it may be added to the main body of thought. In emotional thinking the opposite is true. It may be readily seen how quickly conclusions will exceed premises and how inevitable it is that a part, and often a relatively small and only remotely related part, is mistaken for the whole. This is what the focal infectionists and ductless glandists do. It is likely that psychoanalysis fell into the same error.

Another mark of emotional thinking is its inability to deal with opposition in a mature manner. The more emotional the theoretical thinking the more emotional is the behavior that is set into motion when the theory is questioned. In the early days of psychoanalysis, its opponents were furious about it and became psychoanalytic baiters, clearly showing that they were unable to give intelligent consideration to what they considered an upstart doctrine. In discussions they used such words as "lies", "liars", "dirty", "filthy", and the like, some of the words scarcely being printable. In these days psychoanalysts are a bit too apt to act as though they were superior beings and they are all too ready to accuse non-psychoanalysts of having "resistances" when they question even in part the validity of the Freudian hypothesis. The opposition may not be a question of resistances. It may be an honest, intellectual agnosticism.

I have made certain suggestions as to why the practicing orthodox analyst is more happily placed than his non-psychoanalytic brother. The analyst should find a great source of strength in the carefully worked-out technique of his practice. But is it not an emotional strength? And in the last analysis, does not the psychoanalyst rely *emotionally* on a system which conceivably might be the surrogate for earlier emotionally conditioned authority? If this is true or even partially true, then psychoanalysis has built into its machine certain Frankensteinish parts which may turn upon it and destroy it. It might be better to take a purge.

Proceedings of the Sections

SECTION ON GENERAL MEDICINE

Regular Meeting, October 24, 1938

The Abdominal Aortic Aneurysm: Report of a Case Showing Rupture of Aorta Posterior to Aneurysmal Sac.† Henry D. Jump, M.D., and William G. Leaman, M.D. (*Abstracted below.*)

Some Experience with Anterior Pituitary Growth Hormone Preparations in the Treatment of Human Dwarfism. James E. Cottrell, M.D. (*Abstracted below.*)

The Treatment of Acute Complications in Diabetes. Garfield G. Duncan, M.D. (*Abstracted below.*)

Total Pneumonectomy. Albert Behrend,* M.D., and Moses Behrend, M.D. (*Abstracted below.*)

Abstracts

The Abdominal Aortic Aneurysm: Report of a Case Showing Rupture of Aorta Posterior to Aneurysmal Sac. Henry D. Jump, M.D., and William G. Leaman, M.D.

Although often diagnosed aneurysm of the abdominal aorta is a rare lesion. Nevertheless, it is extremely important inasmuch as symptoms arising from its rupture or dissection often confuse the surgeon in the differential diagnosis of abdominal emergencies, puzzle the urologist when small hemorrhages invade the tissues about the kidney or press on the ureter, and frequently tax the diagnostic acumen of both internist and neurologist in interpreting pain referred to various sections of the body.

We have encountered abdominal aneurysms three times proving the diagnosis in each instance, in 4,058 patients referred to the Cardiac Clinic of the Woman's College Hospital during the past eight years. All were in men past 60 and all were of the

† This paper is scheduled to appear in full in *The New International Clinics*, December, 1938.

**By invitation.*

arteriosclerotic type. The third patient in this series is presented in detail because of the interesting problem in differential diagnosis presented following a portion of the aorta not contained in the aneurysmal sac.

The history, incidence, etiology, physical signs, symptomatology, mode of termination, differential diagnosis and treatment of abdominal aortic aneurysm are discussed. The directions of rupture and the organs usually involved are indicated in a chart prepared from cases reported in the literature. The association of the anginal syndrome with abdominal aortic aneurysm of the arteriosclerotic type is noted.

Some Experience with Anterior Pituitary Growth Hormone Preparations in the Treatment of Human Dwarfism. James E. Cottrell, M.D.

We have studied 17 cases presumed, from the clinical features, to represent pituitary dwarfism; 11 of these patients have received growth hormone preparations in addition to thyroid substance and general hygienic care. In only 2 of these cases did a satisfactory degree of growth-stimulation result. The evaluation of results is difficult because (1) the patients are hard to control, and (2) spontaneous growth is possible at any time.

These experiences convey some suggestions, which can scarcely be called conclusions:

Pituitary growth hormone preparations are capable of producing marked stimulation of growth in favorable cases of human dwarfism.

The chances for a good result are greater if treatment is instituted before the age of 12.

Success is improbable after puberty.

Failure of treatment may be due to (1) incorrect diagnosis; (2) insufficient dosage; (3) antihormones; (4) unknown factors.

The present status of the treatment of dwarfism with pituitary extracts is encouraging but not satisfactory.

The Treatment of Acute Complications in Diabetes. Garfield G. Duncan, M.D.

Diabetes *per se* is not a fatal disease. It is the acute complication that kills. Surgical conditions and acute infections especially maintain the mortality rate of diabetic patients. These complications make the diabetes seem more severe. A state of emergency is thus created in any diabetic patient whether the diabetes be mild or severe.

These acute complications shorten the effectiveness of insulin and also reduce its blood sugar lowering value. Hence more frequent doses and a larger total amount of insulin is needed to control the diabetes.

The control of the diabetes is simplified by dividing the *diet* (protein $\frac{2}{3}$ gm. per kilo of body weight, carbohydrate 150 to 200 gm. or higher and total calories 25 per kilo of body weight) into 6 equal meals, one given every 4 hours. The *insulin* is similarly divided, into 6 equal doses, one preceding each nourishment. Changes in the dosage are based on fractional urinalyses and blood sugar values. Four meals, one every 6 hours and 4 doses of insulin are given as the acute emergency subsides and finally as convalescence is completed the pre-complication program of diet and insulin—if needed—is resumed.

Surgical diabetics, while food by mouth is interdicted, are given 500 cc. of a 10% solution of glucose intravenously at 6 hour intervals. Each administration is accompanied by a dose of insulin given subcutaneously.

On the basis of over 200 major infections and surgical conditions complicating diabetes this program of treatment has proved a simple, practical and effective means of controlling the diabetes during acute complications. Furthermore, it has reduced the death rate in this group.

Total Pneumonectomy. Albert Behrend, M.D., and Moses Behrend, M.D.

The operative mortality in 60 reported pneumonectomies performed by several surgeons is 30 per cent. While this figure is high it must be emphasized that the non-operative mortality of carcinoma of the lung is 100 per cent. Irradiation therapy is of benefit mainly as a palliative measure. Early operation is important.

Total pneumonectomy is indicated in the presence of malignant tumors of the lung or bronchi, in diffuse unilateral bronchiectasis and in stenosis of a main stem bronchus secondary to pulmonary tuberculosis.

Following total pneumonectomy the ribs on the operated side lose their normal concavity. The heart and mediastinal structures shift toward the operated side. The remaining lung increases in size and weight. Post-operatively patients are able to engage in any activity that does not make undue demands on the pulmonary reserve.

SECTION ON MEDICAL HISTORY

Regular Meeting, November 14, 1938

Memoir of R. Tait McKenzie, M.D. E. B. Krumbhaar, M.D. (*Printed in full in this issue.*)

The Insanity of George III: Its Relation to Political and Medical History. Manfred S. Guttmacher,* M.D.

Remarks in Observance of the Bicentenary of the Death of Hermann Boerhaave. David Riesman, M.D.

Presentation of Works by the "Chevalier" John Taylor, with an Engraved Portrait of That Author. Burton Chance, M.D. (*Abstracted below.*)

Abstract

Presentation of Works by the "Chevalier" John Taylor, with an Engraved Portrait of That Author. Burton Chance, M.D.

Bombastic and dishonest, an unblushing charlatan in his methods, Taylor (1703–1772) is said to have possessed, nevertheless, a good knowledge of the eye and to have expressed many original observations. He was the subject of several satiric skits impugning his methods and skill, but he attracted many distinguished clients notwithstanding.

Taylor was a prolific writer, but no accurate count of his works has yet been made—partly because of the confusion arising from

* *By invitation.*

their publication in many languages under varying titles; partly because of the rarity of extant copies.

The works now presented to the College library are the following:

1. Nova Nosographia Ophthalmica. Hamburg & Leipzig, 1766. Text in Latin and German. This rare book, a sumptuous folio, is believed to be the first atlas of eye diseases since the Middle Ages. It is the same work as 2c below.

2. (Incorporated in one volume:)

(a) Mechanismus oder neue Abhandlung von der künstlichen Zusammensezung des menschlichen Auges. Frankfurt a. M., 1750. A translation from the supposedly original edition in French, and a different work from the author's *Mechanism of the Eye*. This is an almost complete text-book, containing, in addition to anatomical descriptions and lists of diseases, a section on optics and refraction (perhaps the first appearance of such a section in a work on the eye) and a bibliography of 50-odd authorities which is of great service to the student of ophthalmic literature. Taylor regarded the *Mechanismus* and the atlas of 243 diseases of the eye (1, 2c) as his best literary productions.

(b) Kurzer Begrif einer anatomischen Abhandlung, von der Gebrechen und Heilungsarten des menschlichen Auges. Frankfurt & Leipzig, 1750. A translation of the author's *Syllabus Cursus Anatomiae*—a proposal for a treatise, rather than the treatise itself.

(c) Kurzer Auszug, oder genaue Beschreibung von zwey hundert und zwey (sic) und vierzig Krankheiten, welchen das Auge und seine nahe liegende Theile unterworfen sind. Frankfurt a. M., 1750. This is an earlier edition than the *Nova Nosographia Ophthalmica* of the work on 243 diseases of the eye. The title-page is found among the preliminary leaves of the *Mechanismus*, the work itself being preceded by a short-title page reading, *Kurze Anleitung zu den Vorlesungen über die Krankheiten des Augapfels und dessen nahe liegenden Theilen.*

(d) Tractat von Augenkrankheiten, nebst einem Briefe des Herrn von L*** . . . Frankfurt & Leipzig, 1750. It seems not to have been observed that this is another translation of the author's *Traité sur les Maladies de l'Organe Immediat de la Vue*, Paris, 1735, which had been translated into German and published in Berlin the same year (1735). Taylor is said to speak apologetically of this work, in the *Mechanismus* (2a), as a youthful product, but was evidently not averse to its republication at the same time.

Framed portrait of John Taylor. Engraved by Robert Cooper after the painting by W. De Nune.

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SECTION ON OPHTHALMOLOGY†

Regular Meeting, October 20, 1938

JAW WINKING: MARCUS-GUNN PHENOMENON. REPORT OF A CASE ASSOCIATED WITH CONGENITAL PTOSIS. Samuel B. Hadden, M.D.

TWO CASE-PRESENTATIONS OF DETACHMENT OF THE RETINA SUCCESSFULLY OPERATED ON WITH THE THERMOPHORE. H. Maxwell Langdon, M.D.

OBJECTIVE SIGNS OF BLINDNESS WITH PARTICULAR REFERENCE TO APPLICANTS FOR BLIND PENSIONS. Alfred Cowan, M.D.

BILATERAL METASTATIC PNEUMOCOCCIC PANOPHTHALMITIS. Jacob Reber,* M.D., and Harold G. Scheie,* M.D.

TREATMENT OF SERPIGINOUS ULCER WITH ANTI-PNEUMOCOCCIC SERUM. Harold G. Scheie,* M.D.

Regular Meeting, November 17, 1938

THE DEVELOPMENT OF OPHTHALMOLOGY IN ONE LIFE-TIME. Edward Jackson, M.D. (George E. de Schweinitz Lecture I).

† The proceedings of the Section on Ophthalmology are abstracted in the *American Journal of Ophthalmology* and the *Archives of Ophthalmology*.

* *By invitation.*

SECTION ON OTOLARYNGOLOGY‡

Regular Meeting, October 19, 1938

Moving Pictures in Color of Benign and Malignant Tumors of the Larynx. Gabriel Tucker, M.D.

Osteomyelitis of the Frontal Bone Following Frontal Sinus Disease. Samuel R. Skillern, M.D.

Regular Meeting, November 16, 1938

Some Observations on the Present Status of Frontal Sinus Surgery. Charles T. Porter,* M.D.

SECTION ON PUBLIC HEALTH

Regular Meeting, November 7, 1938

Pellagra and Other Deficiency Diseases from a Public Health Standpoint. John H. Musser, M.D.

Dietary Deficiency Diseases and Their Prevention. Herbert T. Kelly, M.D.

‡ The proceedings of the Section on Otolaryngology are abstracted in the *Archives of Otolaryngology.*

* *By invitation.*

Memoir of David Hendricks Bergey, M.D.*

By Joseph McFarland, M.D.

David hendricks bergey, the son of Godshalk R. and Susan D. (Hendricks) Bergey, was born on the lower Menonite Meetinghouse farm in Skippack Township, Montgomery County, Pennsylvania, on December 27, 1860, and died of renal disease in Philadelphia, September 5, 1937. He is buried in the cemetery of Trinity Reformed Church at Skippack, Pennsylvania, to which church he belonged. He was the second in a family of three boys and three girls.

As a boy he helped to work his father's farm and attended the the public school in Skippack for eleven years—until he was eighteen years old. He attended private school for several summers and then became the teacher of the Skippack school for two winters. Later he attended the West Chester Normal School and Ursinus Academy (Collegeville), each for one session.

Deciding that he would become a doctor, he began the study of medicine in the spring of 1881 under the preceptorship of Dr. Samuel Wolf, then practicing in Skippack. In 1881 he entered the Medical Department of the University of Pennsylvania for the regular course of instruction that continued over three years.

At that time all who desired to study were admitted to medical colleges regardless of the quality of their preliminary education, and frequently were graduated without any cultural attainments whatever. Under such circumstances the position of the doctor in many a community was embarrassingly low when compared, for example, with that of the minister or even of the lawyer.

Dr. George B. Wood, who was the directing force of the University's Medical School, had frequently expressed regret at the lack of cultural background of many of the medical students, and

*Read April 6, 1938.

sought for some means of overcoming it. Unfortunately, at the time of which we write, all medical colleges were conducted by their faculties for the profits that could be derived from the student's fees, so that the thought of introducing any measure by which some student might be discouraged from studying medicine was never seriously entertained. Wood, himself, however he may have regretted that all medical students were not college-bred men, probably never thought of suggesting that they should be required to be such when admitted. His idea was that they should be taught additional subjects cognate with medicine after they had been admitted. To that end, at his death, he left the University of Pennsylvania a sum of money with which to pay certain professors for giving extra courses in such subjects. Thus came into existence the Department Auxiliary to Medicine in which all ambitious students were encouraged to register, and in which at otherwise unoccupied hours—noon hours and Saturday afternoons—they attended lectures upon Biology, by Leidy; on Botany by Rothrock; on Mineralogy by Howell and on Hygiene by Richardson. Some hours of laboratory work by men of less distinction were also given, and at the end of two years of this instruction, taken, it is understood, simultaneously with the regular course, the successful candidate was at first graduated M.D. at the commencement of the Medical Department, and then, later, at the College Commencement, originally Ph.D., but later B.S.

It was on May 1st, 1884 that Bergey received his M.D. and on June 10th, his B.S. from the University of Pennsylvania.

One month after having been graduated, Bergey was married, on June 5, 1884, to Miss Annie S. Hallman of Skippack, and, no hospital internship being at that time necessary as a preliminary, set out to practice medicine in North Wales, Pennsylvania, only a few miles from home.

For nine years he continued the partly adventurous and partly monotonous life of a small town and country practitioner of medicine. But in 1892–3 the opening of the Laboratory of Hygiene of the University of Pennsylvania took place under the direction of John S. Billings, with A. C. Abbott as assistant, and Bergey saw a new opportunity suddenly opened to him.

In October, 1893, he entered the department as a student and advanced with remarkable rapidity. At the end of the first year he was made (1894–5) a Thomas A. Scott Fellow in Hygiene. In another year, 1895–6, Assistant in Chemistry, and in one more year, 1896–7, when Abbott succeeded Billings as Director of the Laboratory, Bergey was advanced to the position of First Assistant. In that position he remained until 1903, when the teaching of bacteriology to medical students was transferred from the medical department to the Laboratory of Hygiene, and he was made Assistant Professor of Bacteriology. In 1916 he was advanced to Assistant Professor of Hygiene and Bacteriology.

It is both interesting and remarkable to find how energetic, ambitious and persistent was Bergey's thirst for knowledge. While practicing in North Wales he registered as a non-resident student in the Illinois Wesleyan University, for courses in science and philosophy, and after several years of work and the successful passage of examinations, was awarded the degree of M.A. While teaching bacteriology and hygiene to students in the Laboratory of Hygiene he attended instruction in other subjects, and in 1916 was awarded the degree of Dr. P. H.

When A. C. Abbott was retired in 1926, Bergey succeeded him as Professor of Hygiene and Bacteriology, in which position he remained until his own retirement in 1931—three years after he had reached the regularly appointed retiring age.

But at 71 years he was still active in mind and body and unwilling to stagnate. He, therefore, accepted a position with the National Drug Company, with which he remained until his death five years later.

During the World War Bergey served in the medical corps of the U. S. Army, being first commissioned as a lieutenant, in 1911, then as captain, 1917, and finally as major, when he was transferred to the U. S. Debarkation Hospital at Richmond, Virginia, November 13, 1918, where he remained until he was discharged. His first assignment to duty was to Camp Greenleaf, situated at Fort Oglethorpe, Georgia, where he remained from August 7th to November 11th, 1918.

Bergey was a member of most of the learned societies appropriate to his calling, viz., the Philadelphia County Medical Society, the Medical Society of the State of Pennsylvania, the American Medical Association, the American Association for the Advancement of Science, the Society of American Bacteriologists (President in 1915—A founder of its Eastern Pennsylvania Chapter), the Society of Natural History, the College of Physicians of Philadelphia, the American Public Health Association, the Association of Military Surgeons, Sigma Xi Honorary Fraternity, the Society of Experimental Biology and Medicine, the Pennsylvania German Society.

As a writer Bergey was voluminous and versatile. He has left us eighty-seven titles of books and journal articles, upon an overwhelming variety of subjects, in public health, biology, physiology, prophylaxis, disease transmission, bacteriology, immunology and species identification.

His text-book on "The Principles of Hygiene" passed through seven editions, but the work for which he will be best remembered is "Bergey's Manual of Determinative Bacteriology", published by Williams & Wilkins Company, Baltimore, 1923, the fourth edition of which appeared in 1934. It is a remarkable compilation prepared by a committee of the Society of American Bacteriologists of which Bergey was the chairman, the other members being Francis C. Harrison, Robert S. Breed, Bernard W. Hammer and Frank M. Huntoon.

About the time (1896) when Bergey began to work in bacteriology, the subject progressed with amazing rapidity, and descriptions of new species of microörganisms made their appearance almost daily. To identify and properly classify any given organism became a lengthy and difficult task, so that some kind of systematic assistance was necessary. The idea of a system of classification and tabulation had occurred to others long before. As early as 1888 Eisenberg published a series of tables long relied upon, and in 1901 Frederick D. Chester of the Delaware State College published a most valuable book, "A Manual of Determinative Bacteriology", that all workers found indispensible. But with the advances and additions referred to above it became of less and less help and it was necessary to replace it by something more modern. To this end the Society of American Bacteriologists appointed the committee of which Bergey was the chairman, to review the whole subject of nomenclature, classification and specific determination. How the work was apportioned only the members of the committee know, but the brunt of the burden, as usual, undoubtedly fell upon Bergey, and the resulting "Manual" is justly known as his.

In the preparation of this book it was necessary to read the published description of every microörganism and, if sufficient characterizations were found, to give it its proper place in the new system; if not, to reject it. I know, from visits to his workroom and frequent talks with him, the meticulous care and fidelity with which he did that work. Few men would have bothered with it, fewer completed it as he did.

Meticulousness, industry and perseverance were his personal characteristics. It is seen in his only avocation, which was genealogy. With infinite patience, and laboring over many years, he compiled "The Genealogy of the Bergey Family", following its members in this country from the original German immigrants (whose origin he was never able to determine) through seven generations and giving brief biographical mention of five thousand, seven hundred and sixty-seven individuals. It is, indeed, a massive volume, most of the cost of publishing which he paid out of his own pocket. To members of that family it will remain his chief monument!

Personally Dr. Bergey was a small, shy man, of few words, no social instincts, a very modest manner and few friends.

He began life as a country Dutch boy enured to hard work on a farm; he lived all seventy-six years according to the same pattern and made it—in the words of Mr. Mantalini—"one demnition grind".

Memoir of Henry Robert Murray Landis, M.D.*

By D. J. McCarthy, M.D.

Dr. Landis was born in Niles, Ohio, February 3, 1872 and died in Philadelphia, Pa., September 14, 1937.

His entire life from the days he graduated from Amherst College in 1894 and the Jefferson Medical College in 1897 was spent in service to his fellow men. This service was apart from the routine service that every doctor gives. He had three exceptional qualities; a quality of expertness, an exceptional sympathy and a profound understanding. During practically all of his professional life Dr. Landis suffered from tuberculosis, and this at a time when tuberculosis was considered an incurable disease. Through the later years of his life he suffered from tuberculosis of the larynx. One could well understand that this in itself would intensify his natural kindness and accentuate his sympathy and understanding for patients suffering with this disease.

Notwithstanding this handicap, he joined with that valued group of crusaders who, at the beginning of this century, decided to eliminate the worst plague in medicine from the face of the earth. Like most movements in medicine this crusade has made good, and tuberculosis, instead of being the great scourge that it was, is today an incidental disease.

Dr. Landis joined with that valiant group of men who enlisted in this humane cause under that great leader Dr. Lawrence Flick, who, in the opening days of this century, pioneered in the cause of prevention and treatment of tuberculosis. Many of these men had tuberculosis themselves, which greatly intensified their interest and enthusiasm. Dr. Landis took an active and important part in this work from the beginning.

He was a member of the staff of the Henry Phipps Institute

*Read February 2, 1938.

from its beginning in 1903. He served in the White Haven Sanatorium from 1904 until the time of his death. He gave his services to the poor of Philadelphia at Philadelphia General Hospital from 1904 to 1909, where he had previously served as intern. He was a charter member of the National Association for the Study and Prevention of Tuberculosis, in 1904, and later became one of its vice presidents. He became eventually a director of the clinical and sociological department of Phipps Institute, an institute which from its inception assumed the leadership in the fight against tuberculosis and still maintains this leadership.

One can be a member of all these organizations and simply go along. Landis, on the other hand, was a fighting member in all these factors in the crusade. He gave all that he had, even though from time to time it put him *hors de combat* in a sick bed or in the hospital—until he recuperated sufficient strength to fight onward again.

No man knows what good he accomplishes in this life time. The good that he thinks he does may live after him or it may not. A great doctor gives no thought one way or the other. He simply gives his services, and with it the spirit that is in the man.

Dr. Landis became assistant professor of medicine at the University of Pennsylvania in 1912, later becoming professor of clinical medicine and serving in that capacity until the time of his death.

His book on the "Diseases of the Chest and the Principles of Physical Diagnosis", written jointly with Dr. George W. Norris, has already run through five editions, and is now not only a leading text book on this subject, but is a continuing part of the program for prevention of tuberculosis.

The one thing lacking in public and private and professional life today is leadership. Those who led the crusade against tuberculosis were not self seekers, nor did they desire publicity for themselves. They were men of high idealism and high culture, experts in their own fields of work and activated by a great principle. Dr. Landis was one of the leaders of this great group who fought the successful battle against the great white plague.

Memoir of Richard C. Norris, M.D.*

By William R. Nicholson, M.D.

Richard Cooper Norris, son of the Reverend Richard C. Norris and Sarah Baker Norris, was born in Havre de Grace, Maryland, on November 9, 1863. His father was a native of Virginia and his mother was born and grew up in Baltimore, living there until her marriage. At the time of Dr. Norris' birth his father was the Pastor of a Methodist Church in Havre de Grace, Maryland, subsequently being transferred to Washington, where the young Richard received his preparation for college. The rolls of Dickinson College show that Richard Cooper Norris received the Degree of Bachelor of Arts in 1884 and that he received his Master's Degree from the same institution in 1887. He had early decided to study medicine and after graduation from Dickinson in 1884 he applied for and won a scholarship in the Medical School of the University of Pennsylvania by competitive examination. He graduated in Medicine in 1887, the same year that he received his Master's Degree from Dickinson, and he then applied for an internship at Blockley Hospital, now the Philadelphia General. He won his internship in competitive examination from a group of forty-five applicants, being one of eight interns selected.

The year before his graduation in medicine, at the age of twenty-two years, he had already given evidence of the independent spirit which was always one of his marked characteristics by working during the summer of his second year in medicine in the Garfield Hospital in Washington, thus relieving his father of at least a part of the financial burden inseparable from the life of a Methodist Preacher.

After completion of his internship at Blockley he opened an office near Thirteenth and Spruce Streets, becoming a city physician. There was not much salary attached to this position,—

*Read March 2, 1938.

in after life he stated that the emolument he received just about paid his office rent. However, professional recognition came to him early. In 1892 he was appointed Gynecologist and Obstetrician to Blockley Hospital, and in 1894 he was elected Master of the Preston Retreat, succeeding the late Dr. Joseph Price. He served in this institution continuously until his retirement from practice in May, 1931, at the age of sixty-eight years.

In 1892 he was elected a Fellow of the College of Physicians of Philadelphia, and in 1893, only six years after his graduation in medicine, he was elected a member of the American Gynecological Society. He was early made a member of the Philadelphia Obstetrical Society and during one year he was its President; until his retirement he was active in its scientific work. In his younger days he was a prolific writer; he was the Editor of the "Atlas of Gynecology" and also of the "American Text-book of Obstetrics," the latter having been published in 1896, and he also contributed frequently to current medical literature. Later on, the demands of one of the largest and most successful obstetrical practices in the city interfered with writing, greatly to the loss of the profession.

He was Professor of Obstetrics in the Graduate School of Medicine of the University of Pennsylvania, having been appointed to this position in 1920, and actively participated in this work until July, 1932, when he was made Emeritus Professor, holding that title until his death. In the Undergraduate School of Medicine of the University he was first appointed to professional rank as Assistant Professor of Obstetrics, in 1903, and this title he held until he resigned in June, 1927. Many years ago, in 1896, he was elected President of the Staff of the Methodist Hospital, having been a member of the Staff since the foundation of the Hospital in 1892, and he served as President of the Staff from 1896 until shortly before his retirement in 1931.

Dr. Norris was twice married. His first wife was Miss Nancy Berger, who died shortly after their marriage. In October, 1903, he married Miss Grace Vogt of Philadelphia, by whom he had five children, three girls and two boys, to whom he was a most indulgent father. Mrs. Norris died in 1930. Subsequent to his retirement from active professional work, at the age of sixty-eight, he spent his remaining years very happily, part of the time in California with his two sons, at other times in Vermont with his sisters. He also made a trip to Florida which he greatly enjoyed. For many years he had anginal warnings which he recognized, but which he, with characteristic optimism, made light of, refusing to alter his mode of life. He died June 10, 1937, in Los Angeles, California, after a rather short illness of three weeks, the cause of death being pneumonia and uraemia.

The close association which existed between Dr. Norris and the writer of this memoir, lasting for a period of forty-four years, —the writer being first his student, later his assistant, and still later his colleague,—impels me to pay some tribute to his outstanding qualities. He was an optimist. We of his staff used to say that he never felt a patient's condition to be hopeless until the date of the funeral had been published. He was generous to a fault and his natural sympathy and kindly nature endeared him to his patients and associates. He liked people and was liked by them. For many years he was an enthusiastic member of the University, the Racquet and the Philadelphia Country Clubs. He was a good talker and always had a grasp of the questions of the day, obtained for the most part by his prolific reading during the small hours of the night. Until the beginning of his last illness he was vitally interested in medicine and politics in its broad implications. He was an enthusiastic Wilsonian Democrat and was always ready to take up the defense of Mr. Wilson's policies, in season or out of season, not only during President Wilson's presidential term, but for years afterwards. He was slow to anger, but when his limit of forbearance was reached he could express himself in no uncertain terms. He was one of the most skillful obstetricians who ever practiced in Philadelphia, and he had, as he deserved, one of the largest practices in the city. His judgment, developed by his large experience, was always sound. His feet were always on the ground, and though he was conservative by nature and by his training, yet when radicalism was called for by the exigencies of the case he was always ready to meet the indications presented.

He particularly shone as a teacher and the students of my day in the University Medical School will always remember him as a most successful quiz master at a period when all quizzes were extra-mural, and when therefore only the fit quiz master survived. They will also remember his obstetrical vade mecum, which was the best quiz compend in obstetrics ever published. His work as a Professor of Obstetrics in the early days of the Graduate School of Medicine of the University was outstanding and contributed greatly to the success of the Department in its formative period. He firmly believed, taught and practiced his belief that obstetrics and gynecology were inseparable, and that therefore no man could be considered a safe practitioner of the one unless he was also skillful in the other.

Those of us who were closely associated with him feel his loss deeply. We miss his catholicity; his urbanity; his sense of humor; we miss his ever evident friendship. We miss him!

Memoir of R. Tait McKenzie, M.D.*

By Edward B. Krumbhaar, M.D.

To but few men in our profession has it been given not only to make solid contributions to their own specialties within the profession, but also to bring pleasure to countless thousands through their artistic life and productions. Unlike the "Truants" of medicine, from Keats and Goldsmith to Bridges, Conan Doyle and Maugham, whom Lord Moynihan described so entertainingly, McKenzie continued steadily and successfully throughout his life his professional task of promoting in the youth of his day the cause that he held most dear—not quite the ancient concept of *mens sana in corpore sano*, but rather, as he put it, in the more modern ideal, *mens fervida in corpore lacertoso* (the eager mind in the lithe body) (inscription on the Olympic shield that he designed). One cannot say that his art grew out of his work or interest in physical education; it was born in him, as with all true artists, and found spontaneous expression in every act of his daily life and in the artistic way in which he handled his professional problems, no less than in his formal artistic creations, of prime international importance as they undoubtedly were. From the routine of a university gymnasium and the necessarily laborious anthropometric measurements of thousands of students to presiding at a scientific or other meeting, or merely at the dinner table—all was done charmingly and easily, the pleasure that he himself obviously took in the procedure being exceeded only by the pleasure that he gave to his audience or companions. A fortnight before his death, when he presided at a meeting of the Section on Medical History of this College, his pertinent, witty and graceful remarks about each speaker or his topic were typical of his method, which endeared him to all who knew him and, incidentally, did so much to improve this Section that we of the Section are at a loss as to what to do without him.

* Read November 14, 1938.

In his remarkable essay, "Compensations at 70,"† that he read to his fellow-members of the Franklin Inn Club when they were gathered together to honor his seventieth birthday, his artistic nature is apparent both in the glimpses depicted in the retrospect and in the actual composition of the text. He calls vividly before us the rather delicate child, roaming the Canadian woods and fields to apply the romance with which his mind had been filled by reading. We can infer the athletic triumphs at college (set forth in more detail in Hussey's biography), but are given a revealing glimpse when we are told that every contest was "prefaced by its period of sickening anxiety and foreboding . . . scarcely balanced by the shortlived triumphs of victory."

To us who first knew the polished, urbane educator and sculptor at the height of his international fame, it is difficult to picture the almost Spartan-like conditions under which he grew up, and the need for self-support, which contributed to shape his sturdiness of character and determination.

Born in a small township near Ottawa, of a Scottish father (a Presbyterian minister like his father before him), the youngster submitted to schooling first by a blacksmith—the father dying when the boy was 9—then at High School, and finally at McGill, from which he emerged with an M.D. after seven years of study at that University. Having to pay for his college expenses by outside work both in term time and during the summer vacations, he became an assistant in the gymnasium while still a student in the medical school. Shortly after, he assumed entire charge of physical training at McGill. His house-surgeonship at McGill having been interrupted by an attack of typhoid fever, which, however, permitted a visit to England as ship's surgeon, he returned to McGill to occupy the position of Director of Physical Training that had been created for him. Here he established for the first time in Canada the compulsory medical examination of all students. He also began the accumulation of anthropometric data that served him so well in his statues of athletes, the first important work of its kind since the Canon (Doryphorus) of Polyclitus and the Apoxyomenus of Lysippus were constructed from athletes' measurements over two thousand years ago.

† Printed in this issue of the *Transactions & Studies*.

Throughout his life he was convinced that "the fundamental desire of youth for physical activity and expression offers a field for education which has lain fallow since the golden age of ancient Greece" ("The Place of Physical Education and Athletics in a University," 1929).

It was not until he was 33 that art formally entered his life, and then as an auxiliary to his scientific work. He had, to be sure, dabbled in watercolors on holiday and worked on charcoal sketches at night school, but as Hussey says, "his natural tendency was to see masses plastically, so that two-dimensional work failed to content him." In 1900, having experimented with medallion reliefs of his friends, and needing illustrations for his study of "The Facial Expression of Violent Effort, Breathlessness and Fatigue" (J. Anat. and Physiol., 1905, **40**, 51), he modelled four masks of athletes' faces representing Effort, Breathlessness, Fatigue, and Exhaustion. These were eventually cast in bronze and we are fortunate in having copies of the masks in our Periodicals Room. Generalizations from the averages of many observations, they must be studied in each anatomical detail to appreciate the scientific faithfulness involved. Two years later McKenzie accomplished his first figure in the round, "The Sprinter," an ideal human figure in the then recently established crouching pose for the start. Its success obtained for him a commission from the Society of Directors of Physical Education in Colleges to model a statue of the ideal modern athlete. Based on the measurements of 400 outstanding Harvard athletes (obtained through McKenzie's friendship with Dudley Sargent), a graceful, full length figure was produced, slightly turned in the act of compressing the dynamometer. It is one of McKenzie's finest works and has been compared favorably by Percy Gardner with the work of the classic Greeks.

An important event, both in McKenzie's life and to us in Philadelphia, occurred in 1904, when the University of Pennsylvania, through Dr. J. William White, who had heard McKenzie lecture and was himself intensely interested in athletics, procured him to fill the newly established Chair of Physical Education. As a full professor in charge of a department on the same plane of importance as other departments of the University, McKenzie found good opportunity to promote his doctrine—quite Grecian in spirit—of the importance of the harmonious development of youth, physically as well as mentally. He was "astonished," but I imagine secretly gratified, to find that the 10 per cent of students "who are against all games" closely corresponded to the number who fail in other subjects and that "those who consistently fail to play their games are down in three or four other subjects too." For 26 years McKenzie held his post at Pennsylvania, becoming Research Professor in 1931 and Emeritus in 1937. During this long period of activity, interrupted only by his war service, he annually gave practical help to thousands of students. Furthermore, he embodied the results of his experience, as permanent contributions, in a series of textbooks of physical education, in more than 100 scientific articles on athletic types, on scoliosis and other deformities; and in his books on "Exercise in Education and Medicine" (1910, 1917, 1923). His "History of Physical Education" unfortunately was still unfinished at his death.

Tait McKenzie's deep loyalty to the University was further shown by his continuance of constructive work there after his retirement from active service and by his valuable advice in the formation of the so-called Pennsylvania Plan, with which he naturally was heartily in sympathy. This method of bringing all forms of University athletics—from Varsity teams down to the humblest individual exercise—into the frame of a regular University department, and thus pointing the way toward elimination of the overemphasis on, and the evils of, American college athletic competition, was in tune with his dearest ideals of youth well educated physically. His affection for the chief scene of his life-work is also to be found in the donation of replicas of his artistic creations to the J. William White collection, and of the library that he had collected on physical education; and in his contribution, shortly before his death, of a medal to celebrate the University's bicentennial anniversary. It has been truly said that whenever the University needed it, "Tait McKenzie was there with his vision and advice."

When plans for periodical international athletic competitions in the style of the ancient Greek Olympics were being discussed in the early nineties, McKenzie, then a young man of about 25, was closely associated with Baron de Coubertin in bringing them to fruition in 1892. He was also concerned with the formation of the valuable Playgrounds Association of Philadelphia.

The Boy Scout movement naturally attracted his sympathy, and in its early days he made a delightful statuette of an ideal Boy Scout, giving its copyright to the Philadelphia Scout Council.

In the World War, McKenzie promptly offered his services to the British R. A. M. C. As a Lieutenant, he was attached to the Aldershot Hospital and soon applied for the instructor's course in Physical Training there. One of the textbooks used was his own "Exercise in Education and Medicine" and he was amused one day, late in his course, to have his young instructor inquire if the author was "any relation of yours." McKenzie was on active service in time to aid in the inspection of Kitchener's Army, and was early connected with the establishment of reconstruction depots for wounded or disabled soldiers—the Convalescent Camps which at home and on the Continent did so much to diminish war wastage. As Major, he was in medical charge of the first "Command Depot" at the Heaton Park Camp at Manchester (1915–1916), where observation of the results of various forms of reconstructive therapy resulted in his books, "Reclaiming the Maimed," and "A Handbook of Physical Therapy" (1918). Various articles, also, such as his chapter on "Mechanical Treatment and Remedial Exercises" in R. F. Fox's "Physical Remedies for Disabled Soldiers" (1917), "Reclaiming the Maimed in War," read at our College meeting of February, 1918, and others were valuable contributions to knowledge of his subject. He once estimated that some 70 per cent of the men at the reconstruction camps were returned to active service. In the spring of 1916 he conducted an extensive inspection of all the home convalescent camps, and that summer was attached to Sir Robert Jones' staff for the sorting out of orthopedic cases. When circumstances dictated his return to this country, his services were sought and freely given in the organization of reconstruction work in Washington. The end of the war found him supervising Canadian reconstruction; the deep impression that the war made on him, especially through its destruction of youth, found lasting expression in his great war memorials.

Tait McKenzie will undoubtedly be remembered longest for his work as a sculptor. As we have seen, it was his need for illustrating plastically his scientific studies that first activated his latent artistic powers; but once begun, the creative urge continued unabated till his death, resulting in several hundred statues, medallions and sculptured memorials that should place him permanently among the ablest sculptors of his time. (Hussey lists 176 items up to the beginning of 1929.) In addition to his figures of athletes, of which some examples have already been mentioned, and his war memorials, he was fortunate in his portrait bas-reliefs and commemorative medals. To mention but a few of those peculiarly connected with our city and profession, all good Philadelphians must know his vigorous Dr. Whitefield (1919); the scientific humanist, Edgar Fahs Smith (1926); and the altogether delightful Youthful Franklin (1914)—all heroic-sized statues on the University campus. Most of our Fellows will remember the plaques of Weir Mitchell, W. W. Keen, Nathaniel Chapman and Samuel Jackson, the medallions of Huger, Crawford Long, Musser and Paul Lewis at the University, of Chevalier Jackson, of J. William White (Rittenhouse Square fountain wall) and Osler (at Hopkins and McGill). The W. W. Gerhard medal of the Philadelphia Pathological Society, the Mary Ellis Bell research prize of the University's Undergraduate Medical Association, the H. H. Donaldson medallion, the Joseph Leidy medal of the Association of Anatomists—the last received by many on the very day of McKenzie's death—these are but some of the permanent memorials of the sojourn of a great artist among us.

Widest known among McKenzie's works are his great war memorials—all characteristically reflecting the eagerness of youth rather than the agony of war. Before the end of 1919 he had already completed for the Church of the Saviour in this city the Memorial Altar to Captain Howard McCall; the attractive

"Blighty" (in the King's Collection at Balmoral); and the portrait-statue of Captain Guy Drummond at Ottawa. The next year produced "The Aviator" (statuette of Norton Downs at St. Paul's School), which was to be followed at longer intervals by the fearless and high-spirited Cambridgeshire lad portrayed in the "Homecomer"; his American counterpart, "The Victor" (Woodbury, New Jersey); "Over the Top" (plaque of Radnor Memorial Garden Seat); the portrait-statue of Lt. Col. Baker, M.P. (House of Commons, Ottawa); "The Volunteer" of the sculptor's native town, Almonte, Ontario; "Alma Mater" at Girard College in this city, and the "Red Cross Nurse" in Washington.

Perhaps greatest of all, and certainly the sculptor's favorite creation, is "The Call 1914" in the Prince's Street Gardens of Edinburgh. This, one of the most successful, and most famous, of World War memorials, was "A Tribute from Men and Women of Scottish Blood and Sympathy in the United States of America to Scotland" and is so inscribed. When the project was first conceived, it was at once obvious that none other than McKenzie should execute such a sculptured tribute. The monument consists of the seated figure of a "kiltie," rifle on knees, with eyes raised in eager gaze toward Edinburgh Castle. He wears no regimental badges, but on his sporran is the symbolic lion of Scotland. On a wall behind the central figure is a long bronze frieze showing a recruiting party answering the "Call." All sorts and conditions of carefully studied Scottish types are to be seen in the pipe-band, followed by a captain and two file in uniforms, and in the following crowd in the costumes of their varied callings. McKenzie's special gift for artistic arrangement has full play in the rhythmic movement of the whole group, yet varied for the individual units; the almost audible skirl of the pipes and the swing of the kilts of the band balances the men in mufti in the rear, whose failure to keep rank permits greater wealth of individual characterization. The more open arrangement of the central portion of the procession, enriching the end section by contrast, gives a harmonious frame for the central figure in front. The memorial was unveiled in September, 1927, and every year on the anniversary a memorial service is held that helps keep alive the great-hearted sacrifices of the war and strengthen the bonds that unite our two countries. McKenzie's request that his heart be buried near the memorial‡ is in keeping with his spiritual inheritance from the Greeks, whose belief that the heart, not the brain, was the actual seat of the soul has been carried over symbolically to our times.

It ill becomes a laymen to pass judgment on the work of a distinguished artist, especially in these days when art has unfortunately travelled so far from our childhood definition of "Man's Expression of the Beautiful." Nevertheless, I believe that all will agree that McKenzie was a true artist and in many respects a great artist. George Gibbs once said: "McKenzie believed in beauty and achieved it. . . . He was interested in the new but not the ugly or violent or wild, like so much modern work that attempts desperately to break with the old traditions." When Provost Penniman awarded McKenzie his honorary degree at Pennsylvania, he truly said: "Your knowledge of anatomy and your opportunities for examining and observing athletes have been joined to the spirit of the artist and to marvellous ability to transform inert and motionless clay into the form of men in action." As Hussey puts it: "We need go no farther than some of McKenzie's work to see how, by skillful choice of poise, the rhythm of a beautiful movement can be expressed in a motionless form" . . . "His genius is of the lucid, calm, and controlled order of the Greeks." Even to the uninitiated it is obvious that his classic simplicity, reticence and sense of harmony, just as much as the circumstance of his portrayal of athletes, recall the great periods of Greek sculpture. Like the Greeks, he was chiefly interested in "the beauty of the perfect body." Aside from his delightful little diversional grotesques—purely Gothic in spirit and execution—in his serious work he was not concerned with the decadent, the painful, the exaggerated or the monstrous; his art was classic in its idealism, saneness, simplicity, restraint and harmony.

Yet I am convinced that it is wrong to regard Tait McKenzie

‡ It was buried at St. Cuthbert's churchyard, Edinburgh.

as a 20th century Greek anachronism. The sturdy austerity of his Cromarty Free Church ancestors, combined with the simple rugged circumstances of his early life, necessarily added to his artistic temperament a Scottish hardiness and determination that was apparent both in his life and works. He was a thinker as well as a creator, a scientist as well as a lover of beauty, a realist as well as a sensitive humanist and generous, beloved friend. He recognized and gracefully adapted himself to the sternness of existence. Even his humor, charming and never caustic or hurtful, occasionally had an element of grimness that suggested rocky origins. Practical, even canny, in thought as in his creative work, he nursed few illusions as he travelled his gracious and picturesque course. Successful far above the average, he naturally had his failures and his trials—which must have been especially trying to the sensitive artist—yet he resolutely and promptly put them aside to plan for future constructive work. Even the characteristic Scottish virtue of thrift finds expression in his "Compensations at 70," when he realized that with limited vitality to give, "we must expend it with increasing thrift as we grow older." In this essay, too, we see his sharing in man's widespread dread of oblivion, the desire to be remembered; yet he could joke about the intolerability of meeting beyond the Styx "a group of bores one has suffered from during life." He realistically concludes that the adaptation of the old to their lowered efficiency is not the result of wise philosophy, but due rather to the indifference of a waning vitality. He recognizes the self-deception required on the down side of the hill to "go on thinking that one's work is of vital importance to the carrying-on of the business of the world"; yet, with Scottish fortitude, he realizes that we must so carry on. "When one has sucked the juices of the tree of life for seventy years, he should not complain when they slowly dry up and he becomes like a ripe apple, ready to fall. He should be willing to fall without regrets." If at 70 the old machine "begins to creak too loudly . . . let us hope it may be promptly scrapped——painlessly, if possible. If not, let us retain at least our fortitude."

Fortunately, Tait McKenzie was not required to submit to this last ordeal. For some months he had occasionally experienced "the tight band that seems to be crushing your chest," but he did not let it interfere with a restricted way of life as sketched for the elderly in his "Compensations." He was still actively engaged in his sculpture—a few moments before his death he had been working on a Canadian-commissioned portrait-bust of Sir Arthur Doughty. He left almost finished a full-length statuette of the Hawaiian swimmer, Duke Kahanamoku, for the erection of which he was planning a trip to Hawaii. In the fall he was to go to St. Andrews University to receive an honorary LL.D.; and in October he was to preside at an international conference on physical education in Washington. He told his friend and cruising companion, Dr. J. Norman Henry, only two months before his death, that he needed to live two more years and that he believed he would do so. His mind still was filled with artistic concepts. Once, shortly before his death, he told me of his hope for another commission having to do with medical research, in which he could portray the eager investigator staving off Death, with the inscription, "Nondum, O Mors" (Not yet, O Death). Life was constructive and happy. On April 28, 1938, he left his work on the Doughty bust to telephone his wife about coming to look at an exhibition of his work that was being prepared. When they had finished the conversation, she heard him call to his chauffeur to get ready; he started to an upper story and fell dead on the stairs. His heart showed no occlusion of the coronary arteries, though their sclerotic condition and his previous attacks were sufficient to show that they were the cause of his death. He was buried by choice in the British Officers' burying ground in Philadelphia—a part of the great Empire to which he never ceased to give his heartiest allegiance.

BIOGRAPHICAL DATA

Born: Almonte, Canada, May 26, 1867; *Died:* Philadelphia, April 28, 1938.

Education: Almonte private and High Schools; Collegiate Institute, Ottawa; McGill B.A., 1889; M.D., 1892.

Family: Parents: William and Catherine (Shiells) McKenzie. *Married:* Ethel, daughter of John O'Neil of Hamilton, Ontario—

an old Ulster family—(1907), in the Chapel Royal, Dublin. *Brothers:* Rev. W. P. McKenzie (Boston), B. S. McKenzie (Ottawa). *Sister:* Mrs. Gilbert Pritchard (Boston).

Positions held: House Surgeon, Montreal General Hospital (1893); Ship Surgeon, Beaver Line (1894); House Physician to Lord Aberdeen, Governor General of Canada (1895–1896); Medical Director of Physical Training, McGill University (1895–1904); Assistant Demonstrator of Anatomy (1894); Demonstrator (1896); Lecturer (1904); Lecturer, Montreal Art Association (1899–1903); Harvard, Department of Physical Education (1900–1901); Professor of Physical Education and Director of Department, University of Pennsylvania (1904–1930); Professor of Physical Therapy (1907–1930); J. William White Research Professor of Physical Education (1931–1937); Emeritus Professor, University of Pennsylvania (1937); Olympic Course, Louisiana Purchase Exposition (St. Louis, 1904); Lieutenant, Major, R. A. M. C. (Eng.) (1915–1919); Inspector of Physical Training and Medical Officer in Charge, Heaton Park, Manchester (1915–1916).

Membership: Society of Directors of Physical Education in Colleges (Pres., 1900, 1904–1909); American Physical Education Association (Pres., 1912–1915); College of Physicians (Chairman, Section on Medical History, 1936–1938); Franklin Inn, Charaka Club (New York), Athenaeum (London, Honorary member); Royal Canadian Academy; Authors' (London), British Officers', Sketch, Century, University, Rittenhouse Clubs, etc.

Honors: LL.D., McGill, 1921; Doctor of Fine Arts, University of Pennsylvania, 1928; various honorary awards, exhibited at Paris Salon and Royal Academy.

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Compensations at 70*

By R. Tait McKenzie, M.D.

When any partnership has come to the end of its term, the question of whether or not it is worth renewing must inevitably come up for discussion. One must view the progress of the business in its periods of inflation and depression; one must estimate its assets and liabilities; and one must weigh the contributions made by each of the partners and their probable ability to contribute to the further success of the firm before committing oneself by signing on for any renewal or extension. And so when two such partners as the body and the spirit have completed seventy years of partnership, and we have the best of all authority to support our belief that this is the proper length of the contract, it seems an appropriate occasion to recall what each partner has given, what changes for better or worse have taken place in them and to decide the advisability or otherwise of undertaking a short extension.

What can one expect from the body and what from the spirit? Looking back with the eye of memory on the young animal that came into this partnership, I see a rather delicate child, sensitive at being called pale-faced, a roamer of the woods and fields, with a mind filled with the romance that Sir Walter Scott and Fenimore Cooper alone could instill, going unwillingly to school, distracted by thoughts of the Deerslayer and Uncas, making clothyard shafts from the straight cedar rails looted from the fences of the unwilling farmers, feathered with care to be sped by bows of rock elm against squirrel, chipmonk and groundhog, the wild pigeon (then still with us), the partridge sitting low on its

* Read at a dinner held in honor of Dr. McKenzie, on the occasion of his 70th birthday, by his fellow-members of the Franklin Inn Club of Philadelphia, May 26, 1937. The paper was subsequently read by the author before the Charaka Club, and is printed here with the permission of Dr. McKenzie, given before his death, now kindly supplemented by that of Mrs. McKenzie.

branch; and, failing all these, even the domestic hen. I can still see the child venturing out on the sawlogs that filled the swollen river in spring, gaining confidence as he leaped from log to log or diving from the wooden cribwork piers into the clear brown of the summer stream on which during the winter he skated, the proud owner of a bark canoe to explore the quiet reaches or run the rapid that punctuated the course of the Canadian River.

I can see the new vistas opened by the athletic life of college, the gymnast classes giving the groundwork of experience and confidence, the epoch-making discovery that one could leap into the air, make a complete revolution, and come down safely without falling, a sensation never to be forgotten, a defiance of all the accepted laws of gravity. The pitting of one's strength, skill, speed, agility, and endurance in formal public competition was also a new experience divided equally between those two imposters, triumph and disaster. Every contest was prefaced by its period of sickening anxiety and foreboding; the reports of uncanny speed or "grasshopper-like" agility in one's opponents or the gigantic proportions and wolflike ferocity of the team one was to meet on Saturday, all were on the debit side, and scarcely balanced by the shortlived triumphs of victory with their tawdry medals or hard-earned cups.

It was the struggle of ambition backed by very moderate physical equipment and a certain resourcefulness over shyness and physical laziness that was perhaps symptomatic of a rather low level of vitality that could not support for long extreme physical effort. The actual achievement of these youthful athletic exploits were for the most part rather mediocre in reality. They might be compared to the crude bronze of a statue as it leaves the mold, unimpressive in color to the eye, full of roughness and imperfections; but the riddle of repetition in telling it to others has smoothed down the asperities, and, with the accumulation of years, the process of polishing has gone on until the original commonplace accomplishment has acquired a sort of fine patina of its own, and the rough casting of 20 becomes at 70 in retrospect a real work of art.

This evolution is not all plain sailing. It requires the banishment or even the passing away of some of one's contemporaries, especially of those who had actually seen the contest itself and who do not fail, in their devotion to fact, to corrode the beauty of our richly patined work of art. One such was a groundsman and trainer at my old college. His remark about my agility was: "Oh yes, I remember him. He couldn't step off the sidewalk without breaking a leg."

This referred to an accident in which I really did break my leg during a high jump. I may add that shortly after he said this he was stricken with incoherence of speech and a palsy of one side of his body; and now there is no eye witness to assail my own account of what I did resplendent with the polish of the kindly years.

As our youthful feats acquire glamor with the years, the satisfaction is offset by the appearance of physical disabilities that spring out unexpectedly from their hidden lurking places. You run to catch a train as you have always done before; but one day you drop into your seat panting, anxiously wondering if the tight band that seems to be crushing your chest will ever relax. You try to leap an easy ditch and fall back into the water, and you find that you have to climb carefully the fence that you used to vault over with ease.

"As the years gather round us like stern faces giving no quarter" we put away reluctantly the boxing gloves, the running shoes, the tennis racket; even the golf clubs are left in their bag. Of course, many keep up violent exercise to an advanced age; but they modify the pace. One can cover 100 yards at 70—but not in 10 seconds. One can cut down trees with an axe—but not for ten hours a day. The old boxer or wrestler learns how to rest his tired heart even when apparently in violent action. The attempt to carry the pace of 20 or 40 into 70 is the peril that constantly faces the veteran athlete who retains his ambitions or, more properly, who cannot curb his vanity, and who boasts that in his case at least the years have not taken their toll. It is akin to the vanity of the hard drinker who thinks he at least is exempt from the physiological effects of alcohol. To him will come the strained muscle and the heaving chest. My obstinate friend Robert Barr at 60 dilated his heart beyond recovery by insisting on going up a mountain he had climbed thirty years before, and at the same pace. Breathlessness is the red light that must not be passed. It is easy to see but sore to feel. Even as we walk, it warns us of rising ground when the ordinary eye would scarcely notice it. It is then that the wise old man stops to admire the scenery, to look into the shop window. He learns to be resourceful in subterfuge and deception to avoid the wounds to his vanity by the casual question of a companion when he has to obey suddenly the warning signal.

I find resource in light, temporary occupations that can be taken up or laid down at will, gardening, strolling, swimming. Even the hot room has its place on the program. It keeps the skin active at least. When Henry Irving went to see Beerbohm Tree in his dressing room after a tempestuous performance he found him wiping the sweat off his face with a towel.

"How is my acting?", he asked.

"Well," said Irving, "your skin is acting well."

The old man can thus make his skin act even without muscular effort by the high temperature of the hot room, and if he follow it with the *ersatz*, or substitute, exercise of a general massage, he can approximate the effect of a good workout. What one must strive for at 70 is poise—mental as well as physical. One must learn to accept the arm of youth with grace, if not yet with gratitude. The world of the blind is said to be limited by the reach of its arms, but he must be supreme within his limit. And so the physical field of the aged is limited by the power of his heart and the state of his senses, and he can still be supreme within his realm. The King has one precious gift to bestow that is his unique contribution. That gift is "Attention," and it is strictly limited. He can notice a person. Thousands of people go to infinite trouble and great expense for a moment's conversation or even for a bow or smile from a royal head. And our vitality is like the attention of the King. We have a limited amount to give and must expend it with increasing thrift as we grow older. The blind transfer their quota of attention usually devoted to sight to the other senses, hearing, touch, smell, and these senses become better developed in them because they get more concentrated attention, and so any aging man's attention is gradually released from the many distractions of physical competitive life and rivalry, and he is increasingly free to concentrate on the diminishing number that remain, and he can give the impression of doing much more than he really does.

All the accumulated experience of an active life, all the ruses he has learned, all the hidden ways of saving energy, and unnecessary movement, the acquired skills of years come to his aid, and there is a peculiar satisfaction in accomplishing skilfully and without undue effort what the young and unskilled have to struggle over without avail. He is like the veteran pugilist who bears down on his young and eager opponent in the clinches, blocking his leads with ease, making him swing and miss, keeping him off balance, and using the ring as Tommy Loughran did, so that when the bell closed the round he was always at his chair while the antagonist had to walk across to his corner.

The man who is well educated physically is not the football hero or the tennis star. He is one who has practiced many forms of sport and who retains the memory of many of its great sensations; one who can recall the explosive effort of the sprint or the leap, the calculated timing of the pole vault or the shot put; one who had disciplined himself against physical pain to hang on in the mile race when his leaden feet seem impossible to lift; who has felt the ecstacy of playing a right hand cross-counter to the chin without a return, or the scoring a clean hit on the mark with the foil; one who has faced and conquered the fear of the giant-circle on the bar, or a back-somersault from the shoulders of an acrobatic partner; one who has felt the sweet sensation in the hands of a low straight drive of the golf ball: for the memory of them remains and, when he sees them done by his successors, he re-lives these experiences with an intelligence, knowledge and intensity of emotion that is quite unknown to the physical ignoramus. It is memories such as these that go far to compensate for the very real loss of vigor that age must submit to; and when joined with the increasing ability to boast unchallenged, when one can find listeners, of what one once could do and did do when young, they almost tip the balance in favor of age.

The dying stock-rider of Adam Lindsay says: "For good undone and gifts misspent, and resolutions vain, 'Tis somewhat late to trouble, this I know. I would live the same life over if I had to live again and the chances are I go where most men go."

I cannot agree with this complacent point of view. Most of the regrets of my age are for what I did not do when I had the chance, and for the neglect to record interesting adventures and encounters, vivid at the time, that have gradually become hazy and finally obliterated by the fog of the years. The little kindnesses that one should have done and didn't; the wrong let go unrighted. Youth is so thoughtless and preoccupied by its own affairs, lacking perspective, so often letting the "urgent" take precedence over the "important" things; and I think one of the compensations of 70 is a keener appreciation of experiences that are scarcely noticed at 30: the contact with a fine mind or personality; the grace that goes with polished speaking and writing; the use of the inevitable adjective in verse or prose. And so one turns to the company of the great through biography, pitting his judgment and experience of life against that of the subject of the biographer, thinking how he himself would have acted under similar conditions. Re-reading the story of Caesar's Gallic campaigns has stirred me as few things have in recent years. One's mind revels in action and adventure increasingly as one's own range contracts. I read these stories at college, but then they were a sort of mental gymnastic exercise, a maze of uncouth words to be parsed and analyzed. The vivid story of the exploit, the uncertain outcome, the fearful odds faced were all to me a new discovery. Caesar did the things one feels oneself doing in the same grand manner, and even if he did tell the story himself, with all the polish and patina that help to make it a great work of art, the story makes inspiring reading.

It is only with the increase of years that we get a true appreciation of style, and, as we browse among familiar books, new beauties peep out like the hepaticas and violets when we take our familiar daily walk in the spring woods. Old books reveal new qualities, and we realize how much we missed along what seemed familiar and well-trodden paths. George Borrow stands a new reading to me every year.

But of course the most astounding and satisfying of all compendiums of wisdom and literature is the Bible. No one can get the flavor of good English without being soaked in its varied and thrilling contents. How can one taste Kipling without it? What is his cry, "Whence comest thou, Gahazi," without a knowledge of the full story of Naaman? And here age has the advantage of youth and is constantly trying to plant its experience into the unheeding minds of the young. That is the hard task of the teacher and college professor. The knowledge and understanding of fine literature, judgment and experience must be cumulative. It is one of the great compensations of old age. The mind becomes keener and more discriminating with the years. It is a double-edged sword, however, for with it goes an increasing impatience and intolerance with the mediocre and the sham. It seems to age that youth ought to know how to discriminate, but wilfully refuses to do so; and age is also sometimes tempted to think that a certain philosophical attitude towards life is responsible for the undoubted fact that his griefs are less poignant, his pleasures less keen, his indignations more difficult to arouse. In this I believe he is usually mistaken. His philosophy is more often indifference. It is an evidence of a waning vitality. He finds himself unable or unwilling to take the trouble required to lash himself into an emotional turmoil. He makes a gesture perhaps, but that is all. He says to his dog, "Sit up on your hind legs"; and when it goes under the sofa, he says, "Well, go under the sofa—for I am determined to be obeyed." Is it not often weariness rather than philosophy? Indifference rather than self-control? What is the great enemy of the mind against which age must wage a losing fight? It is the question that at all times is lurking furtively in the dark caverns of the mind, the ever-recurring question, "What's the use?" It keeps pressing with increasing insistency its baleful query. When it has its inevitable way, we become in the words of the Yale song, "One more job for the undertakers," for we are dead even if we seem to move about like automatic effigies of real men. How wonderfully Rostand expresses the creative urge of the artist in Chanticleer, who believes that the sun cannot rise unless he first crows, and who, when one morning it rises without his aid, still goes on crowing just the same. It takes a good deal of self-hypnotism and self-deception to go on thinking that one's work is of vital importance to the carrying-on of the business of the world, but that is what we must do. And when the task becomes too great; when it is laid down; and when defeat must be acknowledged and the ashes are burned and scattered, "Is that all?". This is the question that has puzzled the mind of man from the beginning of time. I cannot bring myself to believe that there is any justification for the preposterous egotism involved in the doctrine of a personal survival of our individuality after death. Such a doctrine may be necessary as a working theory in an established and formal religion. I don't know. Why should more than a very few survive? I see no reason. What law is to decide which are to survive and which to perish? What is the division line between the worthy and unworthy? Imagine coming into a group of the bores one has suffered from during life, re-inforced by those who have preceded and followed us! Intolerable! Would it not take the edge off the joy of meeting one's few friends across the Styx?

Perhaps a soul may be acquired by the few who have labored to achieve it. Not likely, but possible. In the prodigality of life, animate and inanimate, the importance of the individual seems ridiculously small. The birth, life and death of plant life shows an incredible waste. We destroy millions of potential lives when we lunch on shad roe or take caviar with our cocktail.

The prodigality of nature in producing those who must quickly perish stuns the mind. During the great war I once saw battalion after battalion entrain for the front; every half hour for 24 hours a day and for six days a train left. Everyone knew that few would return. They went on like cattle to the abattoir, most of them scarcely thinking of it, more probably thinking of their next meal or the immediate comfort of their bodies. What was the lasting impression left with me? It was of the cheapness of human life. The giving of it was the cheapest contribution a man could make to a great cause.

"The unrecorded soldier who perished under Ilium's rock built wall has long since been forgotten. The great night has taken him into her lampless hall. The unrelenting waters of erosion have worn away his foot prints in the dust and he is lost as though he had not been."

And what applies to him applies to us all. But there is something less than the untenable theory of immortality with which we can comfort our vanity, something that is worth striving for, something that can be demonstrated, something that is tangible —a sort of relative immortality, if this be not a contradiction of terms.

Our old friend "Bill" White† left his legacy to the Franklin Inn with the proviso that its income be used in some way that "would recall his name to the members," and in this he expressed a very deeply rooted desire or even instinct that we all share—"the desire to be remembered."

Why do we dread oblivion? Is it vanity, or is it something deeper? What is vanity? Undoubtedly we do dread the fall into the abyss of utter forgetfulness, and it is partly that dread that spurs us on to do things that may preserve our identity in the minds of men who come after us. The relative chances of this sort of survival greatly favor the artist, and especially one whose medium is the written word. His far-flung words reach the greatest audience, are most easily preserved, and carry the greatest weight.

Much of the best and worst literature is devoted to eulogy, and sometimes with strange results. When the poet wrote,

> Not marble nor the gilded monuments
> Of princes shall outlast this powerful rhyme
> But you shall shine more bright in these contents
> Than unswept stone besmeared with sluttish lime

he did not realize that the identity of the object of his eulogy would be the subject of controversy and speculation, but only that the vehicle would be as living now as when it left his pen.

† J. William White, M.D.

It is an example of the old contest for immortality between the artist and the object of his art.

The relative distribution of posthumous honors is capricious and uncertain, but the written word in prose, verse, and set to music, is more likely to be preserved, and become part of the legacy of the ages, than the work of the painter or sculptor.

"When wasteful war shall statues overturn and broils root out the work of masonry" the chances of survival are with the artist whatever his medium; and if his work is in touch with universal emotion, it will be constantly re-incarnated, even if his name be lost in the shuffle.

"To have done this is to have lived though fame remembers us with no familiar name."

But fame and the recollection is only for a moment of time at best, for:

> "One night awaits us all, and all must tread
> The road unknown, the pathway of the dead."

In summing up "the ledger of life at 70," balancing its debits and credits, I think the credits have it.

The physical losses of age are balanced by the flattering recollection of the fine animal one once was, and one has not the necessity of proving it continually to the incredulous.

The reserve of accumulated knowledge and experience balances the loss of ability for prolonged effort. The mist of time veils our failures and evasions of decision, our neglect of obvious opportunity, with increasing kindness as the years make it denser. We forget the times when we were asked to make an observation, to write a paper, to look up a reference, to do some service, and let the chance go by default. An account of a man's life written by himself must be always tinged with vanity, conscious or unconscious, omissions, and the lapses of memory which increase with age, the embroidery of facts. The past looms larger and larger with his life.

Memory becomes more important than anticipation, and unfortunately the painful memories are the first to become dim and disappear.

When one has sucked the juices of the tree of life for seventy years he should not complain when they slowly dry up and he becomes like a ripe apple, ready to fall. He should be willing to fall without regrets. He should be able to say with Audrey Brown, "I shall grow old with autumn and not reluctantly." Seventy years of health and strength, mental and physical, is a pretty good run; at that age one can call it a day; and if we sign on for a short extension of the contract, it should be only on the condition that the care of the old machine be not too burdensome. As soon as it begins to creak too loudly, and when it takes all our time and attention, let us hope it may be promptly scrapped—painlessly, if possible. If not, let us retain at least our fortitude.

The Value of the Medical Library to the Social Historian*

By Richard H. Shryock, Ph.D.

Professor of History, University of Pennsylvania

Students of American history have not customarily employed the resources of medical libraries. Nor, for their part, have medical historians in this country usually delved far into the vast and miscellaneous holdings of the general libraries. In consequence, medical historians used largely the technical materials, while general historians employed almost everything except this technical literature. A great gulf was fixed between these professions, partly as the result of the specialization characteristic of nearly all disciplines during the nineteenth century, partly as a result of some confusion among historians themselves as to the limits of their field. If history is to be defined as a study of only such special phases of the past as the political and economic—which was the tendency during the last century—then medical history and medical libraries apparently do not enter the picture. The moment, however, that we envisage general history as a synthesis of all the chief phases of human activity, historians must accord some attention to medical history and indeed to the history of all the sciences.

At the least, the general historian may read medical history and incorporate it into his general narrative. This has not yet been done to any adequate degree. Secondary political or literary trends still receive more attention than do major scientific developments, just as second-rate politicians or poets are given more space than are first-rate scientists. This is well brought out in those cases in which one man was both a physician and a literary figure. Most Americans can tell you something of the

* Read before the Friends of the Library of the College of Physicians of Philadelphia, Nov. 10, 1938.

poet Oliver Wendell Holmes and of his "wonderful one-hoss shay," but few of them ever heard of the essay on puerperal fever. They are even surprised to learn that Holmes was a physician at all. This being true, the authors of our best text-books could still profit by spending some time in medical libraries. They might well read such standard studies in American medical history as those of Packard, Ravenel, and Sigerist, and then weave this scientific thread into the fabric of their narratives. This is what one might call a minimum program in the use of medical libraries by historians.

There is, of course, much more to be done. The historian may discover research opportunities for himself in the medical field—exercising the discretion which we all have, in our dual function as general interpreters and research specialists, to choose some particular phase of history for original investigation. The historian will obviously be limited in such research by his lack of technical education, but there is some compensation in his own training in what we vaguely call "historical method." There are, moreover, certain important aspects of medical history which present simultaneously a minimum of technical difficulty and a maximum of social significance. Obvious illustrations of this will be found in at least some phases of the history of disease, of the public health, of the medical profession as a social group, of irregular practice and quackery, and of medical science as one element in our cultural history.

If time permitted, it were easy to show the essential value of medical library collections for all of these studies. An enormous amount of material relating, for example, to the state of the public health, and to efforts to improve it, lies buried in the files of old medical journals, the transactions of medical societies and congresses, the publications of boards of health, and so on. Much of this data, to be sure, would indicate trends already known; but in other cases their use would suggest new perspectives. No one very familiar with this literature would make the observation, still so frequently heard; namely, that practically all social control of the public health dates from the days of Pasteur and the development of medical bacteriology. I doubt if any recent public health program, in any American city, can boast the reduction in total mortality which Savannah apparently achieved by its drainage program as early as 1817–1823.[1]

A study of the history of medical sects, such as homeopathy, the Grahamite health cults, osteopathy, and Christian Science, may in some cases be best conducted in medical libraries. This should bear fruits of interest to both general historians and to medical men. The first will get a glimpse of hitherto little-known nineteenth-century reform movements. Some, like Grahamism, were typical of all reforms of that period in their romantic enthusiasms. Medical theories, religious zeal and moral earnestness[2] blended in a manner somewhat bizarre to the present point of view but quite in keeping with early Victorianism. On the other hand, the public health movement noted above was rather atypical in its scientific restraint.

Meanwhile, physicians also may find new perspectives in the history of irregular practice, as in the continuity—or at least the close analogy—between orthodox "systems" of the eighteenth century and the heretical "sects" of the succeeding period. The earmarks of the old systems were a monistic pathology and a monistic therapeutics deduced therefrom. One can see this easily in John Brown of Edinburgh, or in his classmate Benjamin Rush of Philadelphia. But one can also observe it in the later Hahnemann and homeopathy, in Thomson and Thomsonianism, in Still and osteopathy, and in Mrs. Eddy and Christian Science. Just about the time that Hahnemann apeared, medical science evolved statistical and experimental checks on speculative systems, and forced those which could not "measure up" out of the regular profession. They survived as our modern sects, or were re-absorbed upon attaining to regular standards. Will

[1] W. Duncan, M.D., *Tabulated Mortality Record of the City of Savannah* (Sav., 1870) p. 36. The rates ascribed to "autumnal diseases" dropped from about 90 per thousand to about 28, in terms of a three year average.

[2] For the medical aspects of Grahamism see Hebbel E. Hoff and John F. Fulton, "The Centenary of the First American Physiological Society Founded at Boston by William A. Alcott and Sylvester Graham", *Bull. of the Inst. of the Hist. of Med.*, V, (Baltimore, 1937) pp. 687 ff. For the social and moral phases see R. H. Shryock, "Sylvester Graham and the Popular Health Movement, 1830–1870", *Miss. Val. Hist. Rev.*, XVIII (Iowa City, 1931) pp. 172 ff.

they ever reappear in the regular profession? Here I commend for your serious consideration a study of Freud and Freudianism in the light of these generalizations.[3]

Lest some of my colleagues protest, at this point, that the study of medical sects is a bit beyond their focus, let me hasten to add that the greatest value which general historians may find in medical materials relates after all to themes with which they have long been familiar. Some of the most comprehensive or suggestive accounts of the living conditions among special classes, such as the laboring population in Britain or the slave population in the United States, will be found in medical articles or reports. Thus, Chadwick's famous Poor Law Board medical report of 1842 probably affords us the most complete available picture of living conditions among the English working classes of that time. Accounts by American physicians of health conditions among negro slaves, 1830–1860, occasionally published in the medical journals, are not only suggestive but probably more non-partisan than any others to be had.

One finds, again, indications of the spread of an early birth-control movement among the upper classes in this country, in the medical and health journals of the period 1840–1860. This seems to have been missed by the historians of contraception, but is certainly of some significance in view of the far-reaching consequences of such a movement.[4] It is also somewhat diverting to find the first evidences of this in a supposedly prim, Victorian setting. Historians who overlook the medical literature would probably never suspect the existence of this trend at so early a period.

Other illustrations of medical materials pertinent to social history can be found in the descriptions of serious epidemics. These throw some light, of a rather lurid nature, upon the immediate and obvious reactions in public institutions and public behavior during times of crisis. We learn something of old Philadelphia, and of human nature as well, in Rush's graphic accounts of the yellow fever epidemic of 1793. Last but not least among

[3] R. H. Shryock, *The Development of Modern Medicine* (Phila., 1936), pp. 364, 365.
[4] Cf. Norman Himes, *Medical History of Contraception* (Baltimore, 1936), *passim.*

the themes which occur off-hand, one may suggest the value of forensic medicine to scholars interested in that too-American subject, the history of crime.[5]

So much for a brief survey of the opportunities which the medical libraries afford the social historian. It need hardly be added that corresponding opportunities await medical historians in the general libraries, for much of medical interest is preserved there in all manner of records. Rush's story just noted, for example, may be checked against a newspaper account for that year in a general library. There is, indeed, so much general documentary material that is pertinent to medicine, notably to its economic and social phases, that it has recently been suggested that medical libraries themselves reach out and include large collections of this sort.[6] Whether a medical library should attempt to collect all the state and federal publications on public health, social welfare, etc.—an extremely large and difficult literature to check—will presumably depend on such circumstances as its own resources and the size and distance of the nearest general libraries.

This brings one naturally to a consideration of the various types of materials available to a social historian in such a great collection as that of this College. The resources here are particularly appealing to the historian, not only in sheer quantitative terms, but in a qualitative sense as well. This is not to be wondered at when it is recalled that the College is one of the oldest medical institutions in the country, and that it is located in the city which was so long the chief medical center of the nation. Nor is it a small thing, incidentally, that the historian working here is also close to the other great medical collections in Boston, New York, Baltimore and Washington.

This library is, first of all, rich in manuscript records pertaining to all periods in our history from the Revolution to the present, but especially for the early national era. There are account

[5] Note the use of this literature in the recent study of A. E. Fink, *Biological Theories of Crime*, (Phila., 1938), *passim.*

[6] See A. F. Kuhlmann, "Some Neglected Categories of Research Materials Bearing upon Social Aspects of Medicine", *Social Forces*, XV (Chapel Hill, N. C., 1936) pp. 379 ff.; R. H. Shryock, "Library Collections in Social Medicine", *Public Documents* (Amer. Lib. Asso., Chicago, 1936) pp. 351 ff.

books, lectures, journals and correspondence of such leading Philadelphia physicians as Benjamin Rush, Kuhn, the Bonds, Meigs, Wood, and others. This is just the sort of thing which the social historian welcomes, in his search for confidential, and therefore often frank, opinions of contemporary events.

Manuscript lecture notes supplement the picture of theory and practice gained from published works. Thus, while Rush writes that bloodletting may be carried to the point of removing four-fifths of all the blood in the body, we find in Kuhn's unpublished manuscripts a definite warning against such excessive bleeding. Account books give us some inkling as to the diseases most commonly observed, as well as fees charged. Journals and correspondence are promising for professional history, since the writers may express frank "inside" opinions on their colleagues and on the problems of their guild. These same materials are essential to biographical studies of medical leaders, and it is precisely such studies that are so much needed to round out the history of medicine in Philadelphia. It is a striking fact that there are very few, if any, full-length portraits in print of these leaders, in the whole interval between Benjamin Rush and S. Wier Mitchell.

The library also contains some interesting examples of manuscript professional materials, such as papers relating to the medical congress connected with the Centennial of 1876, and notably its own records. It is obvious that the history of the College itself, like that of the New York Academy, is significant not only for medical history but for American cultural history in general.

When one comes to the published literature, there is an embarrassment of riches. Perhaps most valuable for the social historian are the extensive files of the older medical journals and the transactions of the older societies. The complete files of such periodicals as the *American Journal of the Medical Sciences* or the *Boston Medical Journal* are storehouses of information which have hardly yet been seriously exploited. So, too, are voluminous transactions of such bodies as the American Medical Association and the American Public Health Association. A considerable number of medical libraries contain these standard series, but few are as rich as this College in its collection of minor journals and transactions.

Historians will find the great mass of technical works of less significance and more difficult to handle, but it is not to be forgotten that the older ones usually can be understood by any scholar who has had a good general training in biology and the physical sciences. The older technical works, moreover, occasionally throw side-lights on social conditions in general. Charles D. Meigs' work on obstetrics, for instance, suggests much about the social position of women in his day.[7] And recent texts frequently include brief historical introductions to their respective fields, which are sometimes quite enlightening.

It is well worth emphasizing some of the special opportunities which seem to present themselves in the use of this library and of other collections in this area. It has been suggested that a rich store already awaits exploitation. This fact should not make for complacency, but rather for further efforts to add to our materials at the same time that we encourage scholars to employ them. Two programs are here indicated: first, a purchasing policy on the part of the library; second, a training policy on the part of both medical and social historians. It is hardly my place to elaborate upon the first, other than to express a hope that the library will continue a constant search for the older materials—especially for the rare files of minor journals and transactions. I trust, also, that opportunities may be occasionally found to acquire relatively large collections which contain such items. If you will pardon a personal reference, I would recall the fact that Dean W. C. Davison of the Duke University Medical School and I were able a few years ago to acquire as a gift the collections of the old Georgia Medical Society amounting to several thousand volumes, for the mere cost of transportation.[8] The active members of the Society no longer felt able to pay for the storage of the older materials, which seemed of small use in their present practice.

The encouragement and training of historians to use the library presents various difficulties. In principle, we should give medical historians some training in social history, and historians

[7] Read, e.g., his peroration to the "genteel female" in *Females and Their Diseases* (Phila., 1848), pp. 40 ff.

[8] They are now maintained as a permanent loan in the Duke Hospital Library.

some training in medicine, but in practice this is not so easy as it sounds. The Hopkins Institute offers an excellent training in medical history which involves an orientation in related social history and the social sciences, but it must still be difficult to find chairs for men who have a complete formal education of this sort. While we await greater opportunities along this line, which will presumably be fostered by the re-organized American Association of the History of Medicine, we may do something to improve our local program. Courses are now offered in medical history at Pennsylvania and at Temple which would be valuable to students of history; and if the members of these classes—or any physicians who are interested—could ever spare the time, I am sure that we would welcome them as auditors in our advanced courses in history at the University of Pennsylvania.

Our more immediate problem as historians is the training of a few graduate students to work in medical history or in that of the other sciences—particularly for the study of what one might call the social and cultural history of science. Our present training program is geered to the older conception that history is a field arbitrarily confined to certain phases of the past, an understanding of which involves no technical preparation. The moment we suggest that a student work in the history of medicine, or any other technical field for that matter, he protests that he has had no training therein. I do not believe this is an insuperable obstacle; but rather envisage the day when we will train our first year graduate students in historical method, and then devote their second year to a minimum technical training in some particular field like medicine. In their third or fourth years, they could return to us for supplementary course work, but primarily for the preparation of a thesis. Such a program will have to be undertaken gradually and will involve such coöperation as the technical faculties may be able to offer, but I think it can be worked out in a manner at least more satisfactory than is the present situation.

Permit me to conclude with just one more statement as to the importance of studies in medical history in this particular area. The unusual opportunities have already been stressed; their unusual significance should also be emphasized. Of all regions in this country, that of the old "middle colonies" or middle Atlantic states has received least adequate historical attention. There are no histories of the area comparable to the standard works on New England, the South, or the West. Within the middle area itself, Pennsylvania suffers most in this respect, since there are excellent coöperative histories of New York and New Jersey, but none for this State. Within a still smaller compass, there is a sad lack of good historical studies of Philadelphia, either of its economic, political or cultural past, although an excellent beginning has been made in works on special themes by such scholars as Provost Smith, Oberholtzer, Quinn, and Bradley.

Such neglect has its own consequences. We teach colonial history as the story of New England and Virginia, despite the fact that the Middle Colonies were at times the most populous, most wealthy and to some extent the most cultured in the narrow sense of the term. We look back to Boston as the "Athens of America" and are rather inclined to deprecate Philadelphia as a national cultural center. This is partly because Boston apparently excelled in literature—a field to which historians or other writers customarily gave much attention. Philadelphia, on the other hand, led in the medical and other sciences which were, and still frequently are, ignored by scholars and historians as outside the cultural tradition.

But the major reason for our recognition of New England or Virginia is simply the fact that New Englanders and Southerners have exploited their past and that, relatively speaking, we have not. Now we can hardly expect New Englanders or Southerners to do it for us, nor indeed should we wish them to take it over entirely. As a rule a New England historian is not primarily concerned with Pennsylvania, and it is only human if he occasionally under-rates us. A recent scholar, in writing of "The Flowering of New England," dismisses Philadelphia culture with a single sentence, in which he ascribes it all to the influence of one New Englander. He overlooked, in this connection, a very simple question: Why did Mr. Franklin so obviously prefer Philadelphia to the Boston of his day?

There is at present a mounting interest in the whole need for more adequate interpretations of the history of Pennsylvania, and of Philadelphia in particular. Scholars in several of our older institutions, such as the Pennsylvania Historical Society, the American Philosophical Society and the University of Pennsylvania, wish to coöperate in such a program. The new Union Catalogue makes it more feasible than it has ever been before. The College of Physicians, I believe, can play an important part in any work which is undertaken. Its library possesses one of the three largest collections in its field in this country, and should be recognized as the natural repository for medico-social material of the kinds I have mentioned. Your Section on Medical History, and this group of Friends of the Library, are agents ready at hand to further the work of collecting additional material. The new policy of your *Transactions & Studies* offers a valuable opportunity to publish under the College's name historical articles of general interest and importance. In a word, the College is in a position to advance simultaneously the study of American medical history, and that of the City and the State which it has so long served.

The Early Years of the Obstetrical Society of Philadelphia*

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(*Part II*)

Joseph Carson, the first duly elected member of the Society, was Professor of Materia Medica and Therapeutics at the University of Pennsylvania. A faculty associate of Francis Gurney Smith, Jr., the first president, he never participated actively in the Society meetings.

Augustine Fish and *Richard A. Cleeman* next joined the group. The former was a genial, kindly, hard-working soul, most conscientious in his care of poor patients in the districts of the Philadelphia Dispensary and at the Lying-In Charity. His death from tuberculosis at the age of 44 was attributed to overwork. Cleeman was of Baltic German descent and of distinguished appearance. He had an identical-twin brother and for years amusing incidents frequently resulted from the confusion arising from their similarity. He was president of the Society in 1883 and 1884, and a prominent member of the College of Physicians. For many years he served on the State Quarantine Board of Pennsylvania. F. P. Henry said of him: "He was a most entertaining talker and never interrupted anyone except himself." He died in 1912, aged 72.

William Pepper, brother of George Pepper, *De Forest Willard*, and *Roland G. Curtin* were elected in 1869. It is because of the far-seeing plans of the first-named, who was once characterized as being "delicately aggressive," that the University of Pennsyl-

* Address of the retiring president, delivered before the Society, May 5, 1938. *Part I* was printed in this periodical, vol. 6, no. 2 (Sept., 1938), pp. 125–147.

vania exists as we know it today. Willard, soon to become the famous orthopedist, was a moving spirit in the establishment of the Philadelphia Midnight Mission, which had for its object the rescue of fallen women. Those of the fallen who, incidentally, were pregnant were urged to go to the old Maternity Hospital for care and thereby keep out of the clutches of the abortionist. There was considerable opposition to this course from those pious and high-minded individuals who insisted that such care and encouragement would only tend to increase immorality in the city! Curtin was a member of the Society until his death in 1913, aged 74. He was a cousin both of Andrew Curtin, War Governor of Pennsylvania, and of Gideon Welles, Secretary of the Navy and staunch supporter of Presidents Lincoln and Johnson. Curtin's medical career was embellished by acknowledged and efficient leadership in his profession and in the community. He was associated with the Lying-In and Maternity Hospitals, as well as with numerous other institutions.

John S. Parry was elected to the Society in 1870. Not a Philadelphian by birth, he settled here soon after his graduation from the University of Pennsylvania in 1865. Even during the days of his residency and early chiefship at the Philadelphia Hospital, his writings showed unusual thought and reflection. His first paper was entitled "Observations on Relapsing Fever as It Occurred in Philadelphia in the Winter of 1869–70." In 1872, he was one of the group (which included Jenks, Curtin, Williams, Duer and Ingham) that founded the State Hospital for Women and Infants, known a decade later as the Maternity Hospital, the early purpose of which, as I have stated, was to give refuge to illegitimately pregnant women and thus divert them from the sordid associations encountered at the Philadelphia General Hospital of those days. In his own words, he wished to spare them the "deteriorating moral influence exerted over young girls who, having fallen victim to the wiles of the seducer or to their own uneducated physical natures, are compelled, in the absence of any other refuge for unmarried women, to enter the Philadelphia Hospital." He soon fell a victim to tuberculosis and suffered from pulmonary hemorrhages, but bravely attempted to carry on his work and his writing—a striking example of ill-advised tenacity of purpose. He went to Florida in 1874 and 1875, in quest of restored health, and while there labored unsparingly on his epoch-making treatise on ectopic pregnancy, and on a paper on puerperal fever. Returning to Philadelphia, he was honored with the presidency of this Society in January, 1876, at the early age of 33, but again ill health forced his return to the South, where he succumbed at Jacksonville, Florida, on March 11, 1876. He had few superiors as a clinical lecturer. William Goodell said that his death taught two things: "First, how surely a man possessing ability, honesty and industry, even though a stranger in Philadelphia, can become so prominent in his profession, and secondly, the absolute necessity of physical and mental rest, if the full measure of our lives is to be run out"—words that we may well take to heart today. Later in the year (December 7, 1876), Parry's widow presented his library to the Society. The College of Physicians eventually became custodian (May 20, 1886), but the designation "Parry Library of the Obstetrical Society of Philadelphia" is still retained.

James V. Ingham, elected in 1870, succeeded George Pepper as secretary upon the latter's death in 1872, serving until 1876 when W. H. H. Githens was elected to the position. In addition to his early connection with the Maternity Hospital, of which he was a founder, he served for a long time on the College of Physicians Committee on the (now abolished) Directory for Nurses. He resigned in 1899, and also severed his connection with the American Gynecological Society, of which he was a founder, in the same year. He died on December 29, 1924, aged 81.

William F. Jenks, a promising obstetrician and author, died of tuberculosis, like Pepper and Parry, at an early age—39, ten years after his election to the Society in 1870. He was a nephew of Howard Furness, Shakespearean scholar and commentator, and James Tyson said of him that "he possessed the grace and charm of this cultured family." His widow established for the College of Physicians a fund in his memory, known as the "Jenks Prize Fund," the income of which was to be devoted to awards for essays on gynecologic and obstetric subjects. In 1901 the College found it advisable to obtain authorization for the income to be devoted to the purchase of books "relative to obstetrics and diseases of women and children."

Wharton Sinkler, elected in 1870, retained his membership until 1887. He became a well-known neurologist, closely associated with Weir Mitchell. He died March 16, 1910, at which time he was vice-president of the College of Physicians. His memory continues to be honored at the College through the establishment of the Sinkler Medicinal Garden adjoining the College building.

J. Cheston Morris, elected in 1870, was the uncle of Elliston J. Morris, a former secretary of the Society (1892) and a present Honorary Member. He was physician to the Episcopal Hospital, which his father, Caspar Morris, had practically founded. For some years prior to his death he could be seen driving about in a high carriage, of bygone style, drawn by a pair of horses, or in his father's low phaeton. He was of dark complexion, and smoked a dark meerschaum pipe while driving with his colored coachman beside him. He died on November 28, 1923, aged 92 years.

John L. Ludlow was for thirty years obstetrician to the Philadelphia Hospital (1857–1887). In 1880, in discussing a paper of Bernardy's on "Recurrence of Puerperal Fever," he mentioned his own experience while a resident at the Philadelphia Hospital, in 1841–42, when an epidemic of puerperal fever of highly inflammatory type occurred. Erysipelas was at the same time rife in the surgical wards. All plans of treatment were tried without avail and the majority of the patients died. During the discussion Parrish told of a similar condition then existing at the Philadelphia Hospital. Ludlow remarked that it was not as virulent as that in 1841–42, and said that when John S. Parry was a resident at the Philadelphia Hospital in 1855–6 one had also occurred, but not so virulent in character. W. S. Stewart reported the blockage of the external os with placental tissue and its removal with forceps, aided by scraping with the fingernail. The patient was toxic. Ingham mentioned the inherent susceptibility of some persons to the action of septic agents. Robert P. Harris spoke of the disturbing influence resulting from the presence of a decomposing mass without real blood involvement. Parrish then said that septicemia of internal origin could not arise until several days after delivery. If puerperal fever arose in twenty-four hours, its source was undoubtedly external and might be carried by the nurse or the doctor. At a previous meeting, Ludlow had commented "on the great prevalence in the habit of producing abortion by such instruments as catheters, probes, knitting needles," and thought it was the duty of every physician to warn his patients of the dangers arising from the operation. He attributed it in some cases to the influence of public lectures attended by women!

William G. Porter, Jr., George and Oliver Rex, Samuel S. Stryker and his close associate from West Philadelphia, *R. M. Girvin*, the last two named being obstetricians to the Philadelphia Hospital, were among those who joined the Society in 1870–71.

James C. Wilson, eldest son of the founder, was elected in 1872; he was a brother of W. Reynolds Wilson. He resigned from the Society a couple of years before succeeding the renowned J. M. Da Costa as Professor of Theory and Practice of Medicine at Jefferson. E. Quin Thornton tells an amusing anecdote about him. Soon after his accession to the chair, he was much perturbed because a maternity patient would not release him from attending her in confinement: "Imagine the Professor of Medicine delivering a woman of a baby," he exclaimed, and added—"but I've got to do it." He died October 28, 1934, at the age of 86.

William H. Parrish, H. Lenox Hodge, William T. Taylor, Milton B. Musser, Joseph V. Kelly, John Ashurst, Jr., and his cousin *Francis*, were among those who were added to the rolls in 1873–4. Noble in character, *Parrish* was an obstetrician and gynecologist who exhibited rare judgment; his practice was of the highest type. He held the chair of anatomy in the Woman's Medical College, was obstetrician to the Philadelphia Hospital, and later became Professor of Obstetrics in Dartmouth Medical College. He was twice president of the Society, in 1890 and again in 1895. At a meeting held on May 8, 1874, Parrish reported a case of an outpatient of the Bedford Street Mission Hospital "who had been under the care of a female physician." She was a rachitic dwarf and lived in Middle Alley, and the description of his visit to the patient is worth repetition:

> It was a rickety wooden building. The house was occupied by a mongrel crowd of whites and negroes in various stages of drunkenness and exhibiting all the evidences of abject poverty, wretchedness, and degradation. We were shown to the garret, a most dismal, forbidding den so low that by persons of ordinary stature the erect posture could not be assumed. The leaky roof let in the wind and rain and there was no fire or other means of counteracting the chilling effects of the weather. By the gloomy light of a smoky coal oil lamp, we saw our patient, a black dwarf, a fit denizen of the contracted apartments. With a couple of boxes for her bedstead and with a few rags and old skirts for her bedding, and in the midst of filth and vermin, her surroundings could but seem to us not at all propitious for the performance of so serious and horrible an operation as craniotomy. The antero-posterior diameter of the superior straight was not more than two inches.

She was treated with morphine and whiskey and finally recognized as one Josephine Scott who had been previously reported upon, following craniotomies, in 1869 and 1872 at the Philadelphia Hospital. Again craniotomy was performed and the patient succumbed from septic infection four weeks later.

On June 3, 1875, *Joseph V. Kelly* told of a postmortem delivery of a child by version and extraction fifteen minutes after the death of the mother. After one hour of artificial respiration, the child breathed, recovery taking place. In discussion, Goodell told of a living child born as late as half an hour after the death of the mother.

William T. Taylor, who resigned in 1886, took a prominent part, as previously stated, in the heated struggle against the admission of women physicians to the Society.

H. Lenox Hodge was the son of the distinguished Professor of Diseases of Women and Children at the University of Pennsylvania (1835–63). The latter, incidentally, became the first Honorary Member of this Society. The son shared with his father the authorship of later editions of Hodge's "Obstetrics," and later became Professor of Clinical Surgery at the University. His death, on June 16, 1881, at the comparatively early age of 45, was said to have been hastened by overwork, which he invited as a panacea for the grief which overcame him when his wife suddenly died from heart disease in the latter months of her pregnancy.

John Ashurst, Jr., became Professor of Clinical Surgery at the University a few years after his election to this Society. In 1898, he became president of the College of Physicians. He died in 1902. It is related of him that at the age of 6 years, while on a visit to the seashore, he was missed soon after his arrival at the hotel, and was found playing the piano to a large and admiring audience of women. Whether this episode forecast his early career in gynecology is open to question.

1875–6 witnessed the acquisition of nearly a score of new members, a few of whom I should mention.

John Guiteras, a Cuban who attended the University of Pennsylvania and later became Professor of Pathology in his Alma Mater, was a noted authority on sanitation and tropical diseases. Eventually he returned to his native shores, where he died on October 28, 1895.

Arthur V. Meigs carried on the tradition of family membership in the Society, of which he was a more or less active supporter until his resignation in 1890. The son of J. Forsyth Meigs,[1] and the grandson of Charles D., he inherited the strong beliefs and dislike for new theories and new ways that characterized his forbears. Particularly engaged in pediatric practice, he was distinguished for his research on the chemistry of human milk and the modification of cow's milk. He achieved the leadership of the College of Physicians in 1904, and during his tenure of office is said to have presided fairly and without malice over the stormy meetings incident to the question of the removal of the College to its present location. He died on New Year's Day, 1912, aged 62. When his son, Edward B. Meigs, read his father's memoir before the College of Physicians, as his father and grandfather before him had been called upon to do for their respective fathers, he spoke as follows: "My father's chief characteristics were a passion for the truth, a strong sense of justice, an intense conservatism, a gentleness which made it difficult to bear the sight

[1] Dr. Meigs' given name is incorrectly spelled on earlier pages of this paper.

or even the thought of suffering, and a frankness and hatred of display which led him to dislike all kinds of material ostentation. His whole life, as it seemed to me, received its color from these characteristics. He sometimes told me that he was far from loving his profession as his father did. He sometimes found his opinions on practical questions opposed to those of the majority of his colleagues. He neither insisted on his own course, nor shirked his responsibilities."

Nathan L. Hatfield, whose memory is honored by a College of Physicians lectureship, and *Andrew Nebinger*, who as early as 1880 urged broader preliminary training and more actual years of medical study, were members until their deaths in 1887 and 1886 respectively.

Alfred Whelen succeeded D. Murray Cheston as treasurer, serving from 1882–90, and was quite active in Society discussions.

Between 1876 and 1884, names well-known to most of us stand out boldly in the roll-book and in the minutes of the meetings. Among them was that of *Washington H. Baker*, of the Lying-In Hospital, who in 1879 presented for J. S. Walsh of Camden, N. J., the skeleton of a rachitic woman and the skull of the foetus, removed by caesarean section. Harris said that this was one of the unpublished cases of caesarean section. At that time it made the 100th authenticated section in the United States and the 23d upon dwarfs, 17 of whom had been white women. It was suggested that the College of Physicians be asked to accommodate the skeleton in their museum. A month later a communication from the College of Physicians stated that they had no room for the Obstetrical Society's skeleton, but finally, in 1886, it was officially assured of a resting-place when the College of Physicians accepted the Obstetrical Society's collection for deposit in the Mütter Museum.

Other new members at this time were: *Eugene P. Bernardy*, of the old Maternity Hospital; *William Darrach*, of Germantown, former surgeon in the Federal Army, soon to pass away, and *William L. Taylor*, former assistant to William Goodell, who became an Honorary Member in 1919. *T. Hewson Bradford*, worker in the old Philadelphia Dispensary, later physician to the Children's Hospital; *Henry M. Fisher*, with us still as an Honorary Member; and *Louis Starr*, eminent in Philadelphia pediatrics, who was destined, because of ill health, to be a resident of England when the great war began, and who passed away in 1925 in France, the land of his mother's birth, and his son's death, for Dillwyn Parrish Starr, serving with the Coldstream Guards, was killed in the battle of the Somme.

Benjamin F. Baer was a teacher in Philadelphia for nearly forty years, most of the time as Professor of Gynecology at the Philadelphia Polyclinic. He wrote considerably, was greatly in evidence at the Society meetings, and was chosen president in 1885 (when he defeated Drysdale for the presidency in the first contested election in the history of the Society, 14 votes to 6). He was re-elected unanimously in 1886. Howard Kelly credits Baer with two original accomplishments: first, simple supravaginal hysterectomy for myoma when the pelvic stump was dropped below the peritoneum without a suture constricting it; second, advocating the closing of the abdomen without drainage in cases of pelvic abscess, when others were draining through Keith tubes, not knowing that the pus was sterile. Baer died on September 11, 1920, aged 72 years.

Thomas M. Drysdale had been assistant to Washington L. Atlee and married the latter's daughter. His name has been associated principally with ovariotomy (he performed his first in 1861) and with the so-called "ovarian corpuscle" alleged to be peculiar to fluids from ovarian cysts. As late as May, 1884, in answer to a question regarding its value in diagnosis, Drysdale replied that "after eleven years silence on the subject and greatly increased experience he still considered the cell pathognomonic." Most active in the Society, he was elected president, 13 votes to 8, over Parrish in 1887, re-elected without opposition in 1888. He had been president of the Philadelphia County Medical Society in 1876, the same year that he became one of the founders of the American Gynecological Society. He died on May 20, 1904.

Edward E. Montgomery soon after graduation from Jefferson Medical College became associated with the Philadelphia Hospital, and it was here that he performed the first successful ovariotomy before a public clinic in Philadelphia. He has been credited by Anders with performing the first interval operation for appendicitis. For nearly thirty years, after having formerly taught at Medico-Chi., he occupied the chair of gynecology at Jefferson, being succeeded by our present fellow-member Brooke M. Anspach. Well equipped mentally, he was of distinguished appearance and an exceptionally successful surgeon. Montgomery made a point of entertaining groups of students in his home on Saturday evenings, and he saw to it that the parties never broke up before midnight—by which time the saloons had closed. He had a dry sense of humor. In 1925, in a reminiscent paper before the College of Physicians, he discussed, among other topics, the early operations for appendicitis, adding: "It remained for our fellow and confrère Deaver to render it fashionable and a source of revenue." (Both of the Deavers, incidentally, were members of this Society in the 80's and 90's). Montgomery was president of the Society in 1896–97, and an honorary member at the time of his death, April 17, 1927, aged 78 years.

John C. Da Costa was president of the Society in 1900 and again in 1901. He was connected with the Lying-In Charity and with the Jefferson Hospital. Plastic surgery of the cervix appealed to him particularly. His favorite expression after falling out with anyone was "I scalped him." He was the father of John C. Da Costa, Jr., and uncle of that outstanding surgical teacher and incomparable personality, John Chalmers Da Costa.

The Society's history from 1884 to the advent of the twentieth century is rich in tradition.

Theophilus Parvin held six professorships in five universities before coming to Philadelphia in 1883 to succeed Ellerslie Wallace as Professor of Obstetrics and Diseases of Women and Children at Jefferson. In 1874, while in Indianapolis, he had been elected a corresponding member, and in 1884 he was made an active member at the same meeting that elected our beloved colleague Dr. Daniel Longaker. In 1889 he was elected president. An eloquent lecturer, Parvin was held in high regard by his pupils. He was chosen president of the American Gynecological Society in 1893. Death, which overtook him in 1898, at the age of 69, was said to have resulted from a systemic infection incurred during an earlier operation.

Howard A. Kelly, dean of our guild, contributed tremendously to our Society during his dynamic decade in Philadelphia. A year out of college, he founded the Kensington Hospital for Women, which under the able guidance of Edward A. Schumann has returned to the faith of its fathers. Early associates were Charles P. Noble, Joseph Hoffman, Hunter Robb, and our present esteemed colleagues and honorary members George M. Boyd and William E. Parke, the latter retaining his connection until the present year. No one has contributed more liberally to modern gynecology, has labored more diligently for the betterment of the human race, or is more facile with the spoken and written word than Howard Kelly. Some of his presentations before this Society were epoch-making.

In May, 1886, he read a paper entitled "Asepsis and Antisepsis; A Plea for Principles not Paraphernalia in Ovariotomy, with Letters from Lawson Tait and Thomas Keith," and in November presented his well-known paper, "Hysterorrhaphy or the Suspension of a Viciously Posed Uterus to the Abdominal Wall by Suture." The operation, he said, should be confined to those cases which cannot be relieved in any other way. A case was introduced as illustrative of the character of the deformity to be treated and the result to be anticipated. In discussion, Joseph Price recalled that Mr. Tait considered it dangerous to stitch the fundus to the abdominal wall, while Longaker feared that expansion of the bladder would be interfered with.

"The Palpation and Sounding of the Female Ureters and its Advantages" was presented a year later. Price objected to the method as being of little practical use, while Montgomery thought it would require extreme skill. Kelly, in closing, offered both his instruments and services. Frequently a visitor here after his removal to Baltimore, he last addressed the Society on Jan. 3, 1924, on "Curettage on the Office Table without Anesthesia." Long may Howard Kelly continue as an outstanding example of perennial youth!

Joseph Price! The mere mention of his name provokes ample thought for an evening of reminiscence. He began his work at the Philadelphia Dispensary in 1877, among the poor and lowly of the city. An ardent follower of Lawson Tait, he revolutionized the principles of pelvic surgery in America. He was a master surgeon, an exponent of simple technic. It has been said that he made the "learned unlearn their pelvic pathology and relearn their pelvic surgery," and, again, to quote Howard Kelly, "He rejected and ridiculed antiseptics and the germ theory, but preached 'asepsis' as some sort of a different doctrine, and thus practically attained his unparalleled results." Kind and considerate to his patients, he was withering in debate and resentful of critical opposition or disagreement. His favorite subjects included "Pus in the Pelvis," "Extra-uterine Pregnancy," "Early Ovariotomy" and "Fibroid Tumors." His scorn for "the electricians," as he called the followers of Apostoli, was well illustrated by the celebrated story of his humiliation of G. Betton Massey in a discussion before the College of Physicians and in his verbal castigation of such therapy in the meetings of this Society.

In September, 1888, Price read a paper, "The Abuses of Caesarean Section." Goodell said the fault lay with the attending physician; that the surgeon was called in at the last minute; he himself had never done a caesarean operation. Kelly thought that Dr. Price's paper was directed at him personally and, in consideration of the garbled statements made and the tone of the paper, he would not answer it. Price said he still held to his opinions and that if Dr. Kelly thought the paper referred to himself, he was welcome to do so.

From 1888 to 1895 he was in charge of the Preston Retreat. He was associated with Penrose and Baldy in the foundation of the Gynecean Hospital in 1887, but within a few years disagreement severed this connection and he later established his own hospital a few doors away, which institution on North 18th Street is now presided over by his nephew and our fellow-member, J. W. Kennedy.

On March 5, 1896, Price read a paper entitled "Presentation of Post-Operative Sequelae and How They Favor Mortality."

The discussion was entered into by Noble, Massey, and Da Costa. In the minutes this discussion, reading as follows, is stricken out with red ink: "After the closure of the discussion by Dr. Price, Dr. Noble rose to correct certain personal statements of the last speaker. Dr. Price again took the floor, but was ruled out of order by the President, Dr. Montgomery, on the ground that the discussion was already closed. Upon Dr. Price's appeal, Dr. Boyd took the chair and on vote of the Society the ruling of the President was sustained." Finally it was moved and seconded that the Publication Committee be authorized to remove from the Transactions all parts of the discussion having a personal bearing. The president ruled that this was the privilege of the committee at all times, and at the next meeting of the Society, held in April, the Publication Committee reported that the personal references had been removed from the discussions of the previous meeting. Price's continuing feud with Penrose and with others became so acrimonious that he was practically forced to resign from this Society in 1898, and it was shortly prior to this time (in 1895) that the Section on Gynecology of the College of Physicians was formed by a group who evidently preferred less powder and shell in their scientific discussions, less brutal criticism, and more respect for personalities. The Section was discontinued in 1907 for the following reasons, as noted in the final report of the Clerk, W. R. Nicholson: "1. That the reasons operative in the formation of the Section have ceased to exist and that it may therefore be considered to have served its purpose. 2. That the necessary limitations imposed upon the Section with regard to its membership prevent the requisite infusion of new blood."

A few years before his death, Price appeared at a meeting (May 7, 1908) to discuss a paper by Hurst Maier on "Acetone in the Treatment of Inoperable Cancer of the Uterus," and at the same meeting President Baldy called upon him to talk about "Drainage of the Pelvic Cavity after Abdominal Section" in the absence of the scheduled essayist, Dr. Ella B. Everett. His death occurred on June 8, 1911, at the age of 58 years. To quote from a pamphlet of years ago, "Joseph Price was a surgical crusader and a surgical genius, but like the crusader and genius in any field, lacked the poise that seems only to be given to the ordinary mortal."

Mordecai Price, less colorful and certainly less voluble, joined the Society in 1887, but resigned two months after his brother left the Society. Associated with him in his work, he attempted to be Joe's business mentor, but to no substantial purpose.

Charles B. Penrose has been mentioned. He was of a strain that was able and brilliant, but coldly deliberate and ruthless. His medical career, while relatively short, was forceful in character. He received the appointment as Professor of Gynecology at the University in 1893, and resigned in 1899, when John G. Clark, fresh from his brilliant association with the Hopkins School, succeeded him. The Gynecean Hospital and its endowment was the product of his planning and industry. He never lost interest in matters of public health, however, and in this he was ably supported by his brother, the Senator. Fond of the outdoors and of animal life, he long served on the Game Commission of Pennsylvania, was instrumental in directing work at the Zoölogical Garden and was influential on the Park Commission. That he was unemotional and undemonstrative is evidenced by the following anecdote. On the birth of his son a former woman patient said to him: "Aren't you thrilled at the coming of Little Boy Blue?" He answered: "Madam, he is not a blue baby; I am not thrilled, but of course the young of all vertebrates are interesting." In the latter years of his life he devotedly attended Senator Penrose in his last illness, when the latter from his Philadelphia sick-bed was shaping the policies of the 1920 Republican Convention. Penrose died in 1925.

John Montgomery Baldy was an able ally of Penrose, and a member of the contemporary group which included Hirst, Noble, Davis and Shoemaker. He, too, entered the lists against Price; he was brilliant in discussion and believed that the best defense was a strong offense. Secretary from 1888 to 1891, he served as president in 1908–09, and in 1912 became president of the Bureau of Medical Education and Licensure of this State, his vigorous leadership doing much to improve the standards of medical education and licensure. Principally associated with the Gynecean Hospital, he was consultant to numerous other institutions in this city and for quite a while held a professorship at the Philadelphia Polyclinic. Well thought of as an operator, Baldy was striking in personal appearance. Schumann said of him in his recent memoir (he died by his own hand on December 12, 1934): "Essentially an emotional man, he never learned to control his reactions to what life brought him and suffered intensely from the frustrations which were inevitable in the career of one who possessed the bold and uncompromising attitude toward men and affairs which was his."

Charles P. Noble has been alluded to. From 1889 to 1910, when a mental breakdown cut short a brilliant career, he was the moving spirit in the Kensington Hospital, where he had succeeded the founder, Howard Kelly. He was renowned, too, for his co-authorship with the latter of a sound and popular work, "Gynecology and Abdominal Surgery." Scholarly in debate, he possessed a sarcastic tongue as well and added his full share to the give and take of the Society's proceedings. He was president in 1898–9. Many will recall his return to our meetings during the recent years that preceded his death in 1936, and the interest with which he entered into our discussions, evidencing now and then a spark of his old fire.

Edward P. Davis, scholarly and oratorical in address, presented certain eccentricities that perhaps discouraged a true understanding of his personality. He was Professor of Obstetrics at Jefferson from 1898 until his retirement in 1925. This came with astonishing suddenness: one afternoon he merely remarked that this was the last time he would visit the obstetrical department or meet his students. At Princeton he had been a classmate of Woodrow Wilson's, and had maintained a close friendship with him ever afterward. At Jefferson Hospital he was attending obstetrician at the birth of President Wilson's grandchild and namesake, Woodrow Wilson Sayre, and the speaker, then a student, well remembers that early March day in 1919 when the War President, just returned from his triumphant European journey, and about to return to the Peace Conference and disillusionment, visited the hospital to meet the newborn grandchild. President of the Society in 1910–11, Davis was made an honorary member in 1925, and who of us privileged to hear him will ever forget the remarkable address delivered in this room three years ago when he returned to the Society as President Norris Vaux's guest speaker? He was then 80 years of age and spoke for an hour or more without reference to a single note. His death was in keeping with his mode of life, for his specific request that no obituary notice appear in the daily papers was rigidly adhered to when he passed away last fall (October 2, 1937).

Barton Cooke Hirst has been so recently among us, and his long and honorable career is so well known to all present, that a recapitulation of his achievements at this time is superfluous. However, we may well be reminded of several outstanding facts. He held teaching chairs continuously for 45 years, for at the age of 29 (in 1889) he succeeded R. A. F. Penrose as Professor of Obstetrics at the University, being the fifth incumbent throughout a span of 117 years (James, Dewees and Hodge were prior to Penrose) and upon his retirement in 1927 he became Professor of Obstetrics in the Graduate School of the University, a position which he held until his death in 1935, at the age of 74. He was the only member to serve as president of this Society three times —in 1893 and 1894, and again in 1918, when the fiftieth anniversary of the Society was celebrated with an appropriate dinner on May 18, 1918, at the Rittenhouse Hotel.

George Erety Shoemaker, president in 1914, died suddenly on January 5, 1922, a few hours before he had planned to read a paper at the meeting of the Society, which promptly adjourned out of respect to his memory. His membership covered a period of 35 years; he was an operator and author of excellent repute, and contributed much to the literature of the day.

W. W. Keen, *William J. Taylor* and *James M. Anders* held membership for a few years in the decade between 1885 and 1895. In 1926, when 89 years of age, Dr. Keen spoke before the College of Physicians on "Surgical Advances in the Past Fifty Years," and a short quotation from his talk is not amiss. He told of assisting Washington L. Atlee in the late 60's and early 70's, of Lister's visit to Philadelphia to attend the International Congress of Medicine at the Centennial Exposition in 1876 and of his own introduction of the Lister method at St. Mary's Hospital on October 1, 1876. He said: "He (Atlee) never operated until compelled to by the size of the tumor. He saved only one out of three cases. Then, in 1876, came the glorious day of emancipation by the antiseptic method! Even that was decried as 'only surgical cleanliness' by those who did not realize what surgical cleanliness was. From then on, Lister's method was simplified. The spray was abandoned, for it caused nephritis in the surgeon even more than in the patient, for he was inhaling the spray during several consecutive operations. Today the method is simplicity itself as compared with the cumbrous ritual of the 70's and 80's." Dr. Keen's death, at the age of 95, occurred on June 7, 1932. *William J. Taylor*, once Keen's assistant, became president of the College of Physicians in 1919, after serving in the World War as Lieutenant-Colonel with Base Hospital #10. He died on January 22, 1936. A member of the Society for only two and a half years, *James M. Anders*, by his well-known achievements in the field of internal medicine, his career as an educator, and his prominence as a distinguished citizen of Philadelphia, carved for himself a memorable niche in the annals of our profession.

Harris A. Slocum, Professor of Gynecology at the Philadelphia Polyclinic, succeeded our honorary member Elliston J. Morris as secretary in 1893, and was in turn followed in this position by *Frank W. Talley*, who served until 1902.

Lawrence Savery Smith answered McKinley's call and died in active service in Cuba, being surgeon to the First Pennsylvania Volunteer Infantry in the Spanish-American War.

William E. Ashton, distinguished author and Professor of Gynecology at the Medico-Chi, later in the Graduate School of the University, was 58 years of age when he entered the World War as a Major in the Medical Corps. He emerged as a Lieutenant-Colonel and brought back to civilian life the Congressional Medal of Honor and the Distinguished Service Cross. He died of pneumonia in 1934, aged 75 years.

John M. Fisher began his surgical career as assistant to the younger Gross. At the time of his death in 1937, at the age of

79, he was Clinical Professor of Gynecology at Jefferson. He served as president in 1902–03, and most of us are familiar with the oratorical fervor of his presentations.

Richard C. Norris, late Professor of Obstetrics in the Graduate School, succeeded Joseph Price at the Preston Retreat in 1894, continuing there to within a few years of his death, which occurred on June 10, 1937, at the age of 73. His position has been ably filled by our fellow-member John C. Hirst, 2d. In 1904–5 Dr. Norris was president of the Society.

John B. Shober, whom Charles B. Penrose credited with the first removal of the appendix in the interval stage (Nov. 11, 1889); *John H. Riera*, who passed away in France but a few months ago; *G. Betton Massey*, faithful to his ideas of the efficiency of electrotherapeusis; *Henry Morris*, *John M. Barton*, *William Atlee Drysdale*, *Levi Hammond*, *Henry Leaman*, *I. P. Strittmatter*, of recent memory, *Radcliffe Cheston*, *Robert P. Harris, Jr.*, son of the founder, and *John G. Clark*, already mentioned; our present honorary members, *George M. Boyd*, *Elliston J. Morris*, *W. Reynolds Wilson*, *William E. Parke*, *Oliver Hopkinson, Jr.*, *Wilmer Krusen*, *William S. Higbee*; and *Marie K. Formad*, the first woman physician elected to the Society; the present active members: *Hurst Maier*, *Frank C. Hammond*, *J. S. Raudenbush* and *William R. Nicholson*—all joined the Society between 1884 and 1900. Special mention should be made of the first women physicians to be elected to membership, on April 7, 1892, of whom six have passed away—*Ida Richardson*, *Clara Marshall*, *Marie Werner*, the first to present a paper in person before this Society *Clara Dercum*, *Anna Fullerton*, and *Anna M. Broomall*, one-time Professor of Obstetrics at the Woman's Medical College, and first to report, through A. H. Smith, a series of prophylactic episiotomies before this Society, on February 7, 1878.

Wilmer Krusen was president in 1906–07; *George M. Boyd* in 1912–13, *Daniel Longaker* in 1915, and *William R. Nicholson* in 1916

Frank C. Hammond was secretary from 1902–13, when *Edward Schumann* succeeded him, and president in 1917. *F. Hurst Maier* was president in 1919.

Honorary membership was originally limited to non-residents of the United States, but this By-Law was waived in 1872, to confer the distinction upon *Professor Hugh L. Hodge.* Afterwards, distinguished foreigners were elected from time to time over a period of twenty years. The list included: Braxton Hicks, Barnes, Hewitt and Tilt of London; McClintock of Dublin and Duncan of Edinburgh; Eduard and August Martin, Schroeder, Sänger, and Schatz of Germany; Fabbri and Morisani of Italy; Auvard of France; and Neugebauer of Warsaw, then in Russian Poland. In 1890 the By-Laws were amended to enable "eminent members of the profession at home or abroad" to be chosen for the honor. Dr. Robert Battey, of Georgia, is the only American, outside of former active members, to have been thus honored.

Corresponding members were elected during the same period and were limited to residents of the United States, exclusive of Pennsylvania, Delaware and New Jersey. Included are names celebrated in American gynecology and obstetrics—Barker, Thomas, Sims, Emmet, Peaslee, Bozeman, Isaac E. Taylor, Jacobi, Mundé, Krug, Polk and Tuttle of New York; Quackenbush of Albany; Buckingham of Boston; William H. and Henry T. Byford, Henrotin, and Ethridge of Chicago; Englemann and Barnes of St. Louis; Sager of Ann Arbor; McMurtry of Danville, Kentucky; Joseph Eastman of Indianapolis; Cordier of Kansas; Meyer of Texas, and Dean of South Carolina. No others were elected between 1894 and the time of the revision of the By-Laws in 1931.

Associate membership was first limited to residents of Pennsylvania (outside of Philadelphia), New Jersey and Delaware. This was amended in 1894 to include residents of any county outside of Philadelphia. Among the early associate members were: Hiram Corson of Conshohocken; Traill Green of Easton; Joseph Parrish of Burlington; R. Stansbury Sutton of Pittsburgh; Frank Muhlenberg of Lancaster, and Hunter McGuire of Richmond, formerly Medical Director of the Army of the Shenandoah Valley and Brigade-Surgeon of "Stonewall" Jackson's famous Command, and later on Medical Director of the Second Corps, Army of Northern Virginia. Associate members continued to be elected until 1931, when the By-Laws were finally revised to provide for only two classes of membership, Active and Honorary.

This completes the individual comment and contemporary remarks respecting the members elected prior to 1901 and their association with the earlier years of the Society. Time does not permit us to go beyond this limit or to make mention of all whose names appear in the original roll-book. We salute them equally in passing; each played his part in establishing the traditional heritage that the Obstetrical Society of Philadelphia has bequeathed to its present membership. It must remain for a future writer to record the characteristics and achievements of those who have come into the Society since 1900, and to tell of the happenings at the meetings since then.

In conclusion, I can offer nothing that is more expressive of my belief in, and affection for, this Society, and of my gratitude to you for having honored me with its leadership throughout the past year, than a few words from William Goodell's presidential address of 1873, wherein he uttered thoughts as fitting today as they were then:

"'The mission of such a society as ours is without end and without limit. Apart from educating its members, it ought to educate the masses. By giving the best to the most, it will become in the land a power for good. There are social problems of the day we ought to confront"; and, finally, "Gentlemen, the future of this Society rests with us. May its prosperity ever be our watchword and our bond of brotherhood! Working in the spirit of truth and with a singleness of purpose, we cannot but attain success—that success which is born of unity and resolve."

DISCUSSION

At the invitation of the retiring president, the following long-time members briefly recalled various events connected with the early history of the Society: Drs. George M. Boyd, Addinell Hewson,[2] William S. Higbee, Daniel Longaker, Alexander MacAlister,[3] Elliston J. Morris, William E. Parke.

[2] Died October 27, 1938. [3] Died November 22, 1938.

Dr. Floyd E. Keene (*Part I*, p. 133) died November 16, 1938.

CHIEF SOURCES OF INFORMATION

Organization and Minute Books of the Obstetrical Society.

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Personal conversations with older members, notably, Drs. Boyd, Longaker, and Parke.

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Index of Names

Agnew, D. Hayes, 128, 131, 143, **145-6**
Alexander, Grand Duke, 126
Allen, Joshua G., 128, **145**
Anders, James M., 301, 307, **308**
Anspach, Brooke M., 301
Apostoli, G., 303
Ashhurst, Francis, 296
Ashhurst, John, Jr., 131, 296, **298**
Ashton, William E., **308**
Atlee, Washington L., 300, 307, 308
Auvard, P.-V.-A., 310

Baer, Benjamin F., 300
Baker, Lewis, 127
Baker, Washington H., 299
Baldy, John Montgomery, 303, 304, **305–306**
Barker, Fordyce, 136, 310
Barnes, A. S., Jr., 310
Barnes, Fancourt, 310
Barr, D. M., 136
Barton, John M., 309
Battey, Robert, 310
Benedict, Estelle A., 144
Bernardy, Eugene P., 136, 295, 299
Binney, Horace, 142
Bismarck, 126
Boyd, George M., 302, 304, 309, 311, 312
Bozeman, Nathan, 310
Bradford, T. Hewson, 299
Broomall, Anna M., 309
Buchanan, *President* James, 142
Buckingham, C. E., 310
Burrage, Walter L., 312

Byford, Henry T., 310
Byford, William H., 310

Campbell, Alexander D., 135
Carson, Joseph, 292
Chase, *Chief Justice*, 125
Cheston, D. Murray, 127, **143-4**, 299
Cheston, Radcliffe, 309
Clark, John G., 133, 305, 309
Cleeman, Richard A., 292
Cleveland, Emmeline H., 135
Cordier, A. H., 310
Corson, Hiram, 310
Curtin, Andrew, 293
Curtin, Roland G., 292, 293
Curtis, Arthur Hale, 312

Da Costa, J. M., 296
Da Costa, John C., **301**, 304
Da Costa, John C., Jr., 301
Da Costa, John Chalmers, 301
Dallas, George M., 135
Daly, Augustin, 127
Darrach, James, 145
Darrach, William, 299
Davis, Edward P., 305, **306-307**
Dean, George R., 310
Dercum, Clara, 309
Dewees, Wm. P., 139, 307
Dickens, Charles, 126
Downs, R. N., 145
Drew, Mrs. John, 127
Drysdale, Thomas M., 300
Drysdale, William Atlee, 309
Duer, Edward L., 128, **137-8**, 293
Duncan, J. Matthews, 310
Dunton, William R., 128, **145**

Eastman, Joseph, 310
Emmet, T. A., 310
Engelmann, G. J., 310
Etheridge, J. H., 310
Evans, Horace G., 136
Eve, 139
Everett, Ella B., 304

Fabbri, G. B., 310
Farragut, *Admiral*, 126
Fish, Augustine, 292
Fisher, Henry M., 300
Fisher, John M., **308-309**
Formad, Marie K., 309
Francis, Joseph, 126
Fullerton, Anna, 309
Furness, Howard, 294

Garfield, *President*, 146
Garrigues, H. J., 133
Gibbon, John H., 137
Girvin, R. M., 296
Githens, William H. H., 128, **138**, 294
Goodell, William, 127, 130, **131-3**, 134, 135, 136, 137, 138, 139, 140, 294, 297, 299, 303, 311
Goodell, W. Constantin, 133
Gould, George M., 312
Grant, U. S., 125
Green, Traill, 310
Gross, S. W., 144, 308
Guiteras, John, 298

Hammond, Frank C., 309
Hammond, Levi, 309
Harlan, George C., 128, **146**
Harlan, *Colonel* Josiah, 146
Harlow, Lewis D., 127, **137**
Harris, Robert P., 127, **130-1**, 295, 296, 299
Harris, Robert P., Jr., 309
Hatfield, Nathan L., 299
Henrotin, F., 310
Henry, Frederick P., 292, 312
Hewitt, Grailey, 310
Hewson, Addinell, 311
Hicks, J. Braxton, 310
Higbee, William S., 309, 311
Hirst, Barton Cooke, 305, **307**
Hirst, John C., 2d, 309
Hodge, Hugh L., 137, 138, 297, 307, 310
Hodge, H. Lenox, 296, **297-298**

Hoffman, Joseph, 302
Hopkinson, Oliver, Jr., 309
Hunt, William, 128, **146**
Hutchinson, James H., 128, **146**

Ingham, James V., 135, 293, **294**, 295

Jackson, "Stonewall," 310
Jacobi, A., 310
James, T. C., 307
Jenks, William F., 293, **294-5**
Johnson, *President* Andrew, 125, 293

Keating, John M., **141**
Keating, William V., 128, **140**, 141
Keen, W. W., **307-308**
Keene, Floyd E., 133, 311
Keith, Thomas, 302
Kelly, Howard A., 130, 300, **302**, 303, 306, 312
Kelly, Joseph V., 296, **297**
Kennedy, J. W., 303
Krug, F., 310
Krusen, Wilmer, 309

Leaman, Henry, 309
Leidy, Joseph, 131
Lincoln, Abraham, 142, 293
Lister, *Lord* Joseph, 307
Longaker, Daniel, 130, 144, 301, 302, 309, 311, 312
Longfellow, H. W., 126
Ludlow, John L., 132, **295-6**

MacAlister, Alexander, 311
McClintock, A. H., 310
McGuire, Hunter, 310
McKinley, *President* William, 308
McMichael, *Mayor* Morton, 126
McMurtry, L. S., 310
Maier, F. Hurst, 304, 309
Margaret, *Queen*, 144
Marshall, Clara, 309
Martin, August, 310
Martin, Eduard, 310
Massey, G. Betton, 303, 304, 309
Meigs, Arthur V., **298-299**
Meigs, Charles D., 138, 139, 141, 142, 298
Meigs, Edward B., 298
Meigs, J. Forsyth, 128, 129, **142-3**, 298
Meyer, Joseph, 310
Milton, John, 139
Mitchell, S. Weir, 295
Montgomery, E. E., 141, **300-301**, 302, 304
Morisani, O., 310
Morris, Caspar, 295
Morris, Elliston J., 295, 308, 309, 311
Morris, Henry, 309
Morris, J. Cheston, 295
Morton, Thomas G., 127, **146**
Moses, 139, 140
Muhlenberg, Frank, 310
Munde, P. F., 310
Musser, Milton B., 296

Napier, *General*, 126
Napoleon, *Prince*, 126
Napoleon III, 126
Nebinger, Andrew, 135, 299
Neugebauer, L. A., 310
Newton, *Sir* Isaac, 140
Nicholson, William R., 304, 309
Noble, Charles P., 302, 304, 305, **306**
Norris, Richard C., 309

O'Hara, Michael, 132
Osler, *Sir* William, 144

Packard, John H., 128, **136-7**
Page, William Byrd, 128, **147**
Parke, William E., 302, 309, 311, 312
Parrish, Joseph, 143
Parrish, Joseph,[2] 310
Parrish, William H., 132, 135, 295, **296-297**, 300

Parry, John S., **293–4**, 295
Parvin, Theophilus, 301
Peaslee, E. R., 310
Penrose, *Senator* Boies, 305
Penrose, Charles B., 303, 304, **305**, 309
Penrose, R. A. F., 131, 137, 307
Pepper, George, 127, **129–30**, 144, 292, 294
Pepper, William, *primus*, 129
Pepper, William, *secundus*, 130, 142, 143, 144, **292–3**
Polk, W. M., 310
Porter, William G., Jr., 143, 296
Prall, C. R., 136
Preston, Jonas, 131
Price, Joseph, **302–305**, 309
Price, Mordecai, 305

Quackenbush, J. V. P., 310

Raudenbush, J. S., 309
Rex, George, 296
Rex, Oliver, 296
Richardson, Ida, 309
Riera, John H., 309
Robb, Hunter, 302
Rodman, Lewis, 143
Rouher, 126
Ruan, John, 143
Ruschenberger, W. S. W., 312

Sänger, Max, 310
Sager, A., 310
St. Martin, Alexis, 129
Sayre, Woodrow Wilson, 306
Schatz, F., 310
Scholfield, Edwin, 128, **145**
Schroeder, Karl, 310
Schumann, Edward, 302, 306, 309
Scott, Josephine, 297
Seymour, Horatio, 125
Shakespeare, William, 144
Sherman, *Senator*, 125
Shober, John B., 309
Shoemaker, George Erety, 305, **307**
Simpson, *Sir* James Young, 139
Sims, J. Marion, 310
Sinkler, Wharton, 295
Slocum, Harris A., 308
Smith, Albert Holmes, 127, 132, **133–6**, 145, 309
Smith, Francis Gurney, Jr., 127, **128–9**, 143, 292
Smith, Lawrence Savery, 308
Smith, Robert Meade, 129
Spencer, R. G., 127
Starr, Dillwyn Parrish, 300
Starr, Louis, 144, **300**
Stevens, Thaddeus, 125
Stewart, W. S., 295
Strittmatter, I. P., 309
Stryker, Samuel S., 296
Sutton, R. Stansbury, 310

Tait, Lawson, 130, 302, 303
Talley, Frank W., 308
Taylor, Isaac E., 310
Taylor, William J., 307, **308**
Taylor, William L., 299
Taylor, William T., 134, 135, 296, 297
Thomas, Charles H., 128, **144–5**
Thomas, T. Gaillard, 136, 310
Thompson, *Chief Justice*, 126
Thornton, E. Quin, 296
Tilt, E. J., 310
Tuttle, George M., 310
Tyson, James, 128, 129, **143**, 144, 294

Vaux, Norris, 307
Vaux, *Hon.* Richard, 126

Wallace, Ellerslie, 128, 137, **141–2**, 301
Walsh, J. S., 299
Warrington, Joseph, 138, 139, 145
Welles, Gideon, 293
Werner, Marie, 309
Whelen, Alfred, 299
Willard, De Forest, 292

Williams, Horace, 128, **144,** 293
Wilson, Charles M., 138
Wilson, Ellwood, 127, 132, 134, 137, **138 40,** 145
Wilson, James C., 138, 144, 296
Wilson, James F., 127, **145**
Wilson, W. Reynolds, 138, **296,** 309
Wilson, *President* Woodrow, 306

York, *Duchess of*, 144

Some Reasons for the Recent Increase of Bronchial Carcinoma*

By William Boyd, M.D.

Professor of Pathology and Bacteriology, University of Toronto

No tumour within recent years has aroused so much interest as that known as bronchogenic carcinoma, primary carcinoma of the lung, or, as I prefer to call it, bronchial carcinoma. It demands the attention of the internist, the surgeon, the radiologist, and the pathologist by reason of the varied clinical and pathological pictures which it may present, the frequent difficulty of diagnosis, and above all by the extraordinary frequency of the disease in recent years. It is with the last of these that we specially concern ourselves today.

In 1912, just two years before the War, Adler published a monograph entitled "Primary Malignant Growths of the Lungs and Bronchi". The opening sentence of that book is rather breath-taking in the light of present-day knowledge: "Is it worth while to write a monograph on the subject of primary malignant tumors of the lung"? Further on in the first paragraph he remarks: "On one point, however, there is nearly complete consensus of opinion, and that is that primary malignant neoplasms of the lungs are among the rarest forms of disease." Nearly all writers emphasize the remarkable increase in frequency in recent years. From being one of the rarest forms of carcinoma it has become one of the most common. Thus, during the 10-year period ending 1936, in the Department of Pathology at the University of Toronto the third most frequent site of primary carcinoma was the lung, being preceded in the list only by the stomach and the large bowel. From 1925 to 1936 there were 53

* Thomas Dent Mütter Lecture LI, College of Physicians of Philadelphia, December 7, 1938.

cases in 4500 autopsies (1.2 per cent). In Winnipeg the incidence was still higher, for between 1927 and 1937 there were 64 cases in 2408 autopsies (2.6 per cent).

The increase in incidence is world-wide. From Europe, America, Asia, Africa and Australia we get the same reports. Everywhere there is the same phenomenal increase in the disease over a period of about 25 years. At first sight it looks as if some mysterious virus had spread over the civilized world causing cancer of the lung to appear where previously it was unknown. When this idea is looked at by the cold light of reason it is seen to be manifestly absurd. In order to explain the increase equally absurd explanations are brought forward. These are nearly all based on the supposition that some carcinogenic agent is inhaled from the air, some agent which we owe to recent industrial and scientific advances. The favorite culprit is tarring of roads, an idea supported by the indisputed facts that tar when applied to the skin may produce carcinoma, and that inhalation of tar dust may produce cancer of the bronchial tree in the experimental animal. This is as reasonable as to say that cancer of the skin in man is usually caused by tar, or that the ingestion or inhalation of aniline dyes is the common cause of carcinoma of the bladder.

The material on which this paper is based represents a cross section of the city of Winnipeg and the province of Manitoba, a part of the country where tarred roads are remarkable for their absence. Nor can the inhalation of automobile waste products be a factor of importance in the great open spaces of the Western prairie. The disease is common in Russia where there is no tarring of roads and few automobiles. Dr. E. L. Turner, who spent ten years at Beyrut, Syria, assures me that cancer of the lung is as common there as in Philadelphia, yet most of his patients lived under the same conditions as did their forefathers in the days of the Pharaohs.

But during these last 20 years something else has spread over the world; knowledge of the disease has been disseminated. This knowledge is much more potent a cause of increase than tarred roads or automobile exhaust gases. The Chinese have two words in their language, one of which may be translated "to look," and the other "to look-see." I feel that the most important cause of the recent increase of bronchial cancer is our ability to "look-see." For more than 400 years it has been known that one of the most common causes of death amongst the miners in Schneeberg in Saxony was a progressive wasting pulmonary disease, presumed to be tuberculosis or silicosis. In 1922 Schmorl showed by means of a series of autopsies that this mysterious disease was none other than bronchogenic carcinoma. Naturally there was an immediate tremendous increase in the incidence of that disease as judged by vital statistics, but it had been there since 1500 A.D. waiting to be recognized. MacCallum, in discussing the first recognition by Doehle and Heller of the true nature of the gross lesions in syphilitic aortitis, remarks: "Since then every one has recognized it at a glance. It seems to be one of those simple triumphs of observation that makes one ashamed of being so blind." Obviously other factors such as the longer duration of life made possible by the advances of preventive medicine may also play a part.

There are four classes of medical men who have to be considered with regard to their ability to look and see. They are the clinician, the radiologist, the bronchoscopist, and the pathologist. Surely it is not possible that all four of these could have been mistaken in the past and needed to have their eyes opened. We shall see.

A *clinical* diagnosis of primary cancer of the lung used to be among the curiosities of medicine. I do not remember seeing a case when I was a medical student and interne in Edinburgh. In their "Diseases of the Lungs," published in 1898, Fowler and Godlee remark that cases of primary malignant disease of the lung "are extremely rare, the large majority of new growths within the thorax being of mediastinal origin." Adler's much more recent statement has already been quoted. In my student days the possibility of mediastinal tumor was constantly considered in the differential diagnosis of such intrathoracic lesions as aortic aneurysm. These tumors seem to have vanished like the snows of yesteryear, just as the sarcomas of the brain have disappeared from our thoughts and writings. But gliomas and bronchial carcinomas have taken their place. In the Leeds General Infirmary, an institution where 80 per cent of the deaths come to the post-mortem room, Bonser found no increase in the number of intrathoracic tumors over a period of 37 years.

From the clinical standpoint there is no form of tumour which is more easily overlooked, especially if the case does not come to autopsy. Just as syphilis may mimic almost any other disease, so bronchial carcinoma may masquerade as many other conditions. I have performed autopsies on cases in which the final clinical diagnosis was pulmonary tuberculosis, bronchiectasis, lung abscess, brain tumor, sarcoma of bone, hyperparathyroidism, primary carcinoma of the liver, cancer of the oesophagus, pleurisy with effusion, purpura, lymphosarcoma, and hypernephroma. The steadily increasing percentage of autopsies performed on hospital patients is therefore a factor increasing the apparent incidence of bronchial carcinoma. The experience at Schneeberg is a striking demonstration of this truth.

There are two great reasons for the difficulties in the way of clinical diagnosis; first, the pulmonary lesion may remain for a long time latent or, rather, occult, and second, the metastases may dominate the clinical picture. One of my patients presented symptoms of a cerebellar tumour. Apart from these symptoms she was otherwise well. A large tumour was removed from the cerebellum, and found to be an adenocarcinoma with marked mucin production. The pathological diagnosis was secondary carcinoma probably from the bronchus, possibly from the gastrointestinal tract. The chest was examined with this in view, but nothing could be found to confirm the pathological opinon. A year later she was admitted with haemoptysis and dyspnoea. An x-ray picture revealed a mass in the lung, and autopsy proved this to be a bronchial carcinoma. A Chinaman was admitted with severe purpura which was thought to be thrombocytopoenic in character. He had some cough and a little haemoptysis, to which no attention was paid. Autopsy revealed bronchial carcinoma with widespread carcinomatosis of the red bone marrow, which was responsible for the secondary carcinoma.

A woman was admitted to the surgical wards with a lump in the breast and enlarged axillary lymph nodes. When the breast was removed the tumour was found to be carcinoma, but the pathological opinion was that this was secondary rather than primary, probably from the lung. Some months later she returned with a tumour in the other breast, and bronchial carcinoma was found at autopsy. A boy, 19 years of age, suffered from bone pains and was found to have widespread decalcification of the skeleton, with a blood calcium of 18 mgms. per 100 cc. of blood. A diagnosis of hyperparathyroidism proved to be incorrect, for he had bronchial carcinoma with general carcinomatosis of the skeleton. In a patient with a mediastinal mass the lesion responded in so remarkable a way to x-ray therapy that a confident diagnosis of lymphosarcoma was made. Autopsy showed that the mass was secondary to bronchial carcinoma. This list could be continued almost indefinitely, but the above examples will suffice. The clinician who is familiar with the vagaries of bronchial carcinoma and with its metastatic possibilities will make a correct diagnosis much more frequently than one who is not, and this familiarity is of comparatively recent date.

The *radiologist* plays an all-important part in the diagnosis of bronchial carcinoma. It is therefore evident that before the present era when every doubtful chest case is x-rayed, very many examples of the disease must have been missed by the clinician. But the radiologist's knowledge, as well as his technique, have advanced greatly in recent years. He now realizes that this diagnosis has often to be made by observation not of the tumour itself, but of its effects in the thorax. The common site of the primary growth is one of the main bronchi at the hilus of the lung, where it is obscured by the heart and the mediastinal structures. But it produces tell-tale effects such as atelectasis, bronchiectasis, and pleural effusion, and these, particularly atelectasis of one or more lobes, are enough to cause the radiologist to suggest and sometimes to state his conviction that the basic lesion is bronchial carcinoma.

The *bronchoscopist* may be the member of the team who makes the diagnosis, for he can not only "look-see," but can also remove a small piece of the bronchial lesion for microscopic diagnosis. He is so new an arrival on the diagnostic stage that it is evident that he must play some part in contributing to the number of cases of the disease which are now recognized. The bronchoscopist, moreover, has learnt that it is not necessary to see a tumour projecting into the lumen of the bronchus in order to make a correct diagnosis. A mere roughening of the mucosa or interference with the normal respiratory movements of the bronchus may be a sufficient indication to the expert.

We now come to the *pathologist*, and here we encounter the greatest difficulty. Granted that the clinician was unable to make a correct diagnosis until the many peculiarities of the tumour were revealed to him, how can one explain the fact that the great pathologists of the nineteenth century failed to recognize the condition if it was really common in those days. I can only suggest what I have found to be true in my own experience. In the past I have missed the correct diagnosis because of ignorance regarding three matters: (1) the nature of the gross lesion; (2) the nature of the microscopic picture; (3) the natural history of the disease, by which I mean its method of spread and the sites of the metastases. Fried points out in his monograph that Goethe's pregnant remark is particularly applicable to bronchial carcinoma: "Was man weiss, man sieht". It is when the eyes are opened by knowledge that they see for the first time what has been there all the time.

The *gross lesion* may be such that anyone can recognize it. When a massive tumour projects into the lumen of the bronchus and nearly or completely occludes it, the diagnosis of bronchial carcinoma is self-evident. Such a state of affairs, however, is the exception rather than the rule. Sometimes there is little more than a roughening of the mucosal surface, which would certainly be missed by an observer unaware of its significance. The direction of the growth is usually centrifugal rather than centripetal, so that the great bulk of the tumour is in the wall of the bronchus and the surrounding pulmonary tissue. The result is that the impression given to the naked eye is often that of a tumour involving the bronchus secondarily rather than of one arising from the bronchus. In the past there can be no question that large numbers of primary bronchial tumours were mistaken in the gross for Hodgkin's disease or lymphosarcoma of the lung. This mistake was all the more readily made because the bronchial and mediastinal lymph nodes are almost always involved and enlarged in primary carcinoma. Pathological museums are full of specimens of carcinoma of the lung which have been labelled as one of the lymphoblastomas. I can say this, because I have detected these mistakes in my own specimens as well as in those of other people. Sometimes it happens that a small primary tumour causes death by metastasizing to some vital organ, itself remaining undetected unless the observer is more than ordinarily alert.

Another cause of error is that the tumour of the lung may be thought to be secondary in character, one of the metastases being mistaken for the primary, a point to which reference will be made in connection with the subject of spread. As primary carcinoma of the lung frequently sets up metastases in other organs, and as the lung is a common site of metastases from cancer elsewhere, it is only natural that in the past many primary lung tumors have been mistaken for metastases from tumors in other organs. Increased understanding of the natural history of these tumors has served to eliminate this source of error.

One other factor must be mentioned in connection with the gross lesion. The most constant effect of bronchial carcinoma is obstruction, which may be due to the tumour growing into the lumen of the bronchus or to compression of the bronchial wall. Secretion collects on the distal side of the obstruction, and stasis and infection are responsible for the development of bronchiectasis and abscesses. The result of these secondary changes may be necrosis, softening and liquefaction of the tumor to such a degree that it largely disappears, and may only be recognized if the wall of the abscess cavity is examined microscopically. Realization of this possibility has revealed a number of carcinomas which would otherwise have been missed.

The second pathological consideration is the *microscopic appearance*. There is perhaps no tumour so pleomorphic as carcinoma of the lung. The structure varies from the most differentiated to the most anaplastic. As the bronchi are lined by columnar epithelium it is evident that the fully differentiated tumour will be an adenocarcinoma. The tumour cells may produce a large amount of mucin, and the occurrence of an abundance of mucin in a secondary tumour (e.g., in the brain) always suggests that the lung may be the site of the primary tumour. Differentiation may be less complete and the cells may not form glandular spaces but may be collected in solid clumps. The cells of this medullary form are still readily recognizable as epithelial in character, and the tumour is evidently a carcinoma. When differentiation is still less complete, the epithelial character may be completely lost, and the cells, both in appearance and in arrangement, may resemble those of a round cell sarcoma or lymphosarcoma. Even in the most anaplastic tumours, however, not all the cells are round and featureless, for some will be seen which are slightly fusiform. These are the so-called "oat-cells", which are highly characteristic of carcinoma of a bronchus. The anaplastic tumours, which in my experience have been the commonest form, resemble lymphosarcoma and round cell sarcoma so closely that they are readily mistaken for these neoplasms. I am certain that in the past this mistake has been a common one, and that the vast majority of so-called mediastinal sarcomas have really been bronchial carcinomas. This is an excellent illustration of Goethe's dictum, "Was man weiss, man sieht". Nowadays an anaplastic round celled tumour involving the hilus of the lung and the bronchial and mediastinal lymph nodes spells bronchial carcinoma, whereas in former years it signified lymphosarcoma of the lymph nodes with invasion of the lung.

The fact that routine microscopic examination of autopsy material is much commoner now than formerly is one reason for the more frequent pathological diagnosis of bronchogenic carcinoma. Max Klotz has recently reported two cases from my laboratory which illustrate this truth. In one of these, the involved lung showed nothing in the gross other than collapse associated with a massive serous pleural effusion. In the other, the appearance of the lung was typical of a chronic organizing pneumonia. In neither of these was a correct pathological diagnosis made until after examination of the microscopic sections.

We come now to the last of the pathological aspects of the subject, but one of the most important, namely the question of *spread* or the *natural history of the disease*. The tumour has a marked tendency to invade both lymphatics and blood vessels. It may, therefore, become disseminated at an early date, but occasionally the tumour may remain localized for months and even years. A knowledge of the organs most commonly affected by metastases is most valuable in arriving at a correct conclusion as to the nature of the condition. Spread takes place through the lung via the lymphatics, particularly the perivascular channels. Owing to obstruction to the lymph flow by cancer deposits in hilar lymph nodes, there may be extension into the lung by retrograde permeation of peribronchial and subpleural lymphatics so that the latter network may be outlined with remarkable distinctness. In this way multiple nodules may be formed throughout the lung, and these may so overshadow the primary lesion that the pathologist may fail to recognize the case as one of bronchial carcinoma. In one of my autopsies on a young geologist this was strikingly exemplified, and it was only with great difficulty that the primary tumour could be detected. Had the natural history of the disease not pointed unmistakably to the correct diagnosis the case would probably have been classified as secondary carcinoma of the lung from some primary undiscovered source elsewhere.

It is, however, with the distant metastases that we are more particularly concerned, for it is the occurrence of certain associations which indicate beyond doubt the true nature of the condition. In my experience and in that of others there are six common sites of metastases: lymph nodes and liver, bones and brain, adrenal and kidney. In 60 cases of bronchial carcinoma examined at autopsy in the Winnipeg General Hospital the incidence of metastases was as follows: regional lymph nodes 59, abdominal lymph nodes 26, cervical lymph nodes 11, liver 24, adrenals 19, bones 16, kidneys 13, brain 10.

The greater part of the mediastinal mass may be composed of malignant bronchial and mediastinal nodes. These are the cases which have been mistaken in the past for lymphosarcoma. The abdominal (retroperitoneal) nodes may be so greatly enlarged as to press on the stomach and bowel and give rise to gastrointestinal symptoms, which in one of my Toronto cases completely overshadowed the pulmonary symptoms. Of particular significance is enlargement of the supraclavicular lymph nodes. Such enlargement should suggest bronchial as well as gastric carcinoma. The likelihood that the primary lesion is in the lung becomes very much greater if the malignant glands are on the right side. Biopsy examination of these glands may lead the pathologist to suggest the possibility of bronchial carcinoma in cases in which no clinical evidence of that disease has yet developed, and I have seen cases where such evidence may not develop for many months.

The liver is often the seat of extensive metastases and may be greatly enlarged. Such enlargement in a patient with persistent cough and some haemoptysis points to the probable diagnosis of bronchial carcinoma. The figures I have given for the brain and the bones are probably too small. In a number of the cases there was not permission for the examination of the head, and the only way to form a reliable estimate of the incidence of skeletal metastases would be to x-ray the entire skeleton after death. In looking for the primary site of a metastatic carcinoma of bone the lung must be added to the well known list of breast, kidney, prostate or thyroid.

Of particular importance is the liability of the adrenal to metastatic involvement, because this is comparatively rare in the case of other carcinomas. In an analysis of secondary carcinoma of the adrenal from any source I have found that those due to bronchial carcinoma equalled in number those due to carcinoma from all other sources, including such common tumours as cancer of the stomach, bowel, breast, uterus, and prostate. It is evident that if multiple carcinomas are found at autopsy and if two of these are in the adrenal and the lung, it is highly probable that the case is one of bronchial carcinoma. This probability becomes a certainty if similar tumours are found in the liver, the brain and the kidney. From this illustration the importance of a knowledge of the natural history of the disease becomes evident if a correct diagnosis of bronchial carcinoma is to be made. Without this knowledge numerous mistakes must have been made in the past. Some years ago there was published from my laboratory a report of two cases in each of which there were highly anaplastic tumours in the adrenal, brain and lung. These we regarded as examples of neuroblastoma of the adrenal in adults, a diagnosis the absurdity of which is now only too apparent.

Let us now retrace briefly the steps that we have taken in our inquiry. We have seen that there are a number of factors each of which has contributed in turn to the sum total of cases of bronchial carcinoma which are recognized at the present day. Of these by far the most important is the truth contained in the saying: "What we know, we see". That is true of coronary thrombosis and it is true of bronchial carcinoma. It is true, moreover, for the clinician, the bronchoscopist, the radiologist, and the pathologist. The eyes of the first three have been opened by the observations of the pathologist. The pathologist's myopia is the most difficult to explain. It may be accounted for in three ways. (1) The gross lesion may closely resemble other neoplasms or may be obscured by changes secondary to bronchial obstruction. (2) Recent years have brought realization of the fact that carcinomas in general and those of the bronchus in particular vary greatly in their microscopic appearance and may closely mimic sarcomas and lymphosarcomas in this respect, so that even the microscope may fail to correct the error. (3) The natural history of the disease as illustrated by the behavior of metastases is highly characteristic, but the knowledge of this truth is of recent date. Without denying the possibility that there may be some real increase in the incidence of the disease, it is suggested that the various factors which have been discussed, coupled with the present increase in the span of life, are sufficient explanation for the apparent increase which has attracted the attention of observers in all countries—observers, however, who have had their eyes opened so that they can look-see as well as look, and who therefore see what they know.

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A New Filtrable Agent Associated with Respiratory Infections*†

By Joseph Stokes, Jr., M.D., Athol S. Kenney, M.D., and Dorothy R. Shaw, M.S.

It would not be worthwhile to add another possible human or animal virus to the already overcrowded field of virus diseases had not very similar findings been obtained by studies of the secretions from Dr. Hobart Reimann's patients[1] both in our own laboratory and in the laboratory of Drs. T. Francis, Jr., and T. P. Magill of the International Health Division, Rockefeller Foundation. The first positive findings to be recorded were obtained by both laboratories at approximately the same time before either group knew that the other was studying the same secretions. The specimens were obtained by the Philadelphia workers two days previous to their collection by the New York workers from the same patient.

It is possible that the time of obtaining the specimens resulted in findings somewhat more clearcut in Philadelphia than in New York. However, Dr. Francis has very kindly permitted their studies to be included with our own in this presentation, and has written he had "a very definite impression that we may have been dealing with some actual agent": namely, the agent which may have been responsible for the clinical picture described by Dr. Reimann.

First to relate the findings by the Philadelphia workers:

Washings were obtained from the nose and throat with sterile broth in the cases of both A and B, and each washing was in-

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† Read before the College of Physicians of Philadelphia, Section on General Medicine, November 28, 1938.

[1] Reimann, Hobart A. *J.A.M.A.*, 1938, **111**, 2377.

jected intranasally into separate ferrets under ether anesthesia. The ferret injected with washings from patient B showed no symptoms, whereas the ferret injected with washings from patient A became comatose within 24 hours, and showed labored respiration with high fever. The coma persisted and the ferret was killed on the fourth day for purposes of passage. Whereas the lungs were essentially normal, the brain showed superficial and deep vascular congestion, although no edema or other change was noted. Successive passages from this ferret's brain emulsified and filtered through a Berkefeld V filter, both intracerebrally in one ferret and intranasally in three successive ferrets, gave no further evidence of disease. However, at the time of the first passage in ferrets similar emulsions from the ferret's brain were injected both intracerebrally and intransally at the same time into Swiss mice following filtration. In seven to ten days a characteristic picture developed, beginning with roughening of the fur, anorexia, and weakness, followed by a slowly developing paresis of the hind legs. When injections by successive passages following filtration were made intracerebrally there was no lung involvement noted, but when intranasal injections only were made the mice showed involvement both of the lungs and central nervous system, the paresis occurring by this route just as it did following intracerebral injections. In the first five passages all mice died and following this the infection became successively less virulent. Following the first three passages intracerebral injections only were performed. The lungs in the mice in the first few passages showed hemorrhagic spots atypical of influenzal pneumonia. Cultures of the brain emulsions showed no evidence of bacterial contamination, following filtration. Successive passages, all with similar findings, were performed for the purpose of increasing the virulence of this filtrable agent, but unfortunately it was lost or became inactive following the fifteenth intracerebral passage. Following the eighth passage in mice, a 10% saline emulsion from the brain of one of the affected mice was injected intracerebrally into a guinea pig. Nine successive passages were made in guinea pigs all of which starting from the seventh to eleventh day showed the same general picture as the injected mice, the guinea pigs also exhibiting both paresis of the hind legs and a bluish-grey, firm, patchy broncho-pneumonia. In guinea pigs also the injections, although intracerebral only, resulted in lung involvement. However, following the ninth passage in guinea pigs the filtrable agent was again lost or became inactive. Glycerinated and frozen material had been stored pending a possible loss of the filtrable agent, but further attempts to restore activity in mice, guinea pigs, and ferrets by using this material were of no avail after seven months, despite the fact that the glycerinated material had been active at two months. Serum obtained from both patients during the height of the disease and following recovery may be useful in a determination of a possible etiologic factor should a similar filtrable agent be available for study at a later date. Dr. I. J. Wolman has furnished pathological sections of the brain and lungs from the guinea pig of the seventh passage, showing the bronchopneumonia and cerebral involvement. No meningitis was present.[2]

To relate the findings of the New York workers, the following is taken from Dr. Francis' account:

"*Patient B:* Serum was given intracerebrally to mice and for four passages it appeared that some reaction had taken place. On the 12th to 18th days the mice exhibited ruffled fur, weakness, loss of appetite, loss of weight and a tendency to paresis of the hind legs. An occasional mouse died. The majority survived and seemed to be well. Transfers were made with brain by the intracerebral route and, after four passages nothing more was observed. Throat washings from the same patient were filtered through a collodion membrane of 780 mμ average pore diameter. This material was transferred by the intranasal and

[2] The lungs show inflammatory changes which have both a lobar and peribronchial distribution. This exudate is made up chiefly of mononuclear cells and fibrin, though occasional clumps of neutrophiles are present also. Destruction of lung tissue with abscess formation has not occurred. The bronchiolar epithelium is piled up into swollen redundant folds with many vacuoles in the cells. There is however, no destruction or metaplasia of the epithelial cells. Mucopus lies in some bronchioles. The fibromuscular wall of the bronchi and bronchioles is thickened and highly vascular.

Diagnosis: Acute bronchitis, bronchiolitis, and pneumonia.

intracerebral routes. After two passages little evidence of infection was observed. The mice continued to gain weight and seemed well.

"*Patient A:* Filtered throat washings were obtained and given to mice intranasally and intracerebrally. In the intranasal series weakness, loss of weight, ruffled fur, crusted eyes and paresis were observed in mice of each of the first three passages, although this was not uniform with all mice in the group. Thereafter no abnormalities were noted in the mice. For passage in this series the lungs were removed and transfers were made by intranasal inoculation. Part of the filtered throat washings were also given intracerebrally. In each of the first seven transfers a similar course of events was noted. Certain mice of each group after an interval of 12 to 20 days showed distinctly abnormal behavior. Transfers were made with the blood and the brain by subsequent intracerebral inoculation in normal mice through seven passages. On the eighth transfer little or no abnormality was noted. On the ninth transfer nothing more was observed.

"Inoculations of ferrets, guinea pigs and rabbits were all negative. Attempts to do serological tests with the serum of the patients and the material from infected mice yielded no results. The sera of the patients taken in convalescence possessed no greater titer of antibodies for epidemic influenza virus than did the sera of the same patients taken in acute illness. Consequently, it seems quite clear that the illness was not due to epidemic influenza virus."

It is of course possible that the two laboratories were dealing with an animal virus that had been found by passage at approximately the same time in Swiss mice. Filtrable agents infective for animals have not been known by us to show this picture. Theiler's virus, pathogenic only for mice and showing paralysis of all four legs, has not been shown to affect the lungs. Since psittacosis virus attacks also the brain and lungs of mice it must be considered in the present group of cases. However, no necrosis of the liver was noted such as occurs in guinea pigs suffering from psittacosis and also subcutaneous or intraperitoneal injections of psittacosis virus do not result in involvement of the central nervous system; the injections must be made into the brain directly. The virus of lymphocytic choriomeningitis does not affect the lungs of mice.

The virus of meningo-pneumonitis described recently by Francis and Magill[3] has a very much shorter incubation period and causes a marked meningitis, which was not true in the case of the present agent.

Whether this agent was of animal or human origin it is impossible at present to state. However, the findings suggest that a new filtrable agent has been described which causes disease in mice, guinea pigs, and possibly ferrets, and it is also possible that it may have been in part responsible for the disease of the patients described.

[3] Francis, T., Jr., and Magill, T. P. *J. Exper. Med.*, 1938, 68, 147.

Proceedings of the College and its Sections, 1938

Proceedings of the College

January 5: Bronk, Detlev W. The Cellular Organization of Nervous Function.[1] (*S. Weir Mitchell Oration VII*)

February 2: Goldblatt, Harry. Experimental Observations on the Pathogenesis of Essential Hypertension.[2] (*Mary Scott Newbold Lecture XL*)

March 2: Longcope, Warfield T. Problems Relating to the Invasive Properties of Hemolytic Streptococci and Their Control by Sulphanilamide.[3] (*Nathan Lewis Hatfield Lecture XIX*)

April 6: Best, Charles H. Recent Experimental Work on Liver Function. (*Nathan Lewis Hatfield Lecture XX*)

May 4: Wilder, Russell. Recent Clinical and Experimental Observations in Adrenal Insufficiency.[1] (*Mary Scott Newbold Lecture XLI*)

October 12: Swift, Homer F., and Cohn, Alfred E. Cardiac Diseases, Infectious and Non-infectious, in Relation to Public Health.[4] (*James M. Anders Lecture XIII*)

November 2: Strecker, Edward A. Should Psychoanalysis Be Purged?[4]

December 7: Boyd, William. Some Reasons for the Recent Increase of Bronchial Carcinoma.[5] (*Thomas Dent Mütter Lecture LI*)

Public Lecture

November 18: Stengel, Alfred. Currents and Counter-currents in the Progress of Medicine.[6]

[1] Printed in the *Transactions & Studies*, 4 ser., vol. 6, no. 2, Sept., 1938.

[2] Printed in the *Transactions & Studies*, 4 ser., vol. 6, no. 1, June, 1938.

[3] Printed in the *Am. J. M. Sc.*, 1938, **195**, 577.

[4] Printed in the *Transactions & Studies*, 4 ser., vol. 6, no. 3, Dec., 1938.

[5] Printed in the *Transactions & Studies*, 4 ser., vol. 6, no. 4, Feb., 1939.

[6] To be printed in a subsequent issue of the *Transactions & Studies*.

Proceedings of the Sections†

SECTION ON GENERAL MEDICINE‡

Regular Meeting, November 28, 1938

The Effect of Water Restriction in Addison's Disease. F. William Sunderman, M.D., and Donald Willson*, M.D. (*Abstract below.*)

A New Infection of the Respiratory Tract with Pneumonia.[1] (a) Clinical Presentation by Hobart A. Reimann, M.D. (b) The Isolation of a Virus,[2] by Joseph Stokes, Jr., M.D.

The Adams-Stokes Syndrome with Special Reference to the Electrocardiogram during Seizures. Robert G. Torrey, M.D., and William G. Leaman, M.D. (*Abstract below.*)

Abstracts

The Effect of Water Restriction in Addison's Disease. F. William Sunderman, M.D., and Donald Willson, M.D.

Studies are reported of the effects of water restriction and of the forced water ingestion, respectively, in a patient suffering with chronic adrenal cortical insufficiency who throughout the period of observation had received a high daily intake of sodium chloride. For several months previous to these studies the patient's condition had been adequately controlled by a similar high daily intake of sodium chloride and by the ingestion of fluids as desired.

During the period in which water was restricted there was a diminished ability of the patient to concentrate sodium and chloride in the urine, and a significant retention of these ions by the individual. During this same period there was a marked

† For the proceedings of earlier meetings (1938) than those recorded here, see numbers 1–3 of this volume of the *Transactions & Studies*.

‡ This Section held 8 meetings during the year, and had an average attendance of 60–70.

* *By invitation.*

[1] See *J. A. M. A.*, 1938 (Dec. 24), **111**, 2377.

[2] Printed in this issue of the *Transactions & Studies*, pp. 329–333.

elevation in the concentrations of sodium and chloride in the blood serum but, since the increase in concentration of these components was associated with a shrinkage of the serum volume, the total quantities of sodium and chloride in the circulating serum were actually reduced.

A normal individual studied under similar conditions excreted sodium and chloride in concentrations approximately 60 percent greater than the patient and no retention of these ions occurred. In the normal individual measurements of serum volume were essentially the same during the periods of fluid restriction and forced fluid ingestion.

Clinically, perhaps the most striking observation was the development in the patient of symptoms of severe adrenal insufficiency induced by the simple restriction of water. Resumption of a normal intake of water resulted in a return to her normal state of health.

The forced ingestion of water in this patient had no appreciable influence upon the serum volume or the concentrations of sodium and chloride in the serum.

The Adams-Stokes Syndrome with Special Reference to the Electrocardiogram during Seizures. Robert G. Torrey, M.D., and William G. Leaman, M.D.

The entire presentation consists of a motion picture film. The site of the lesion in the conduction system in a case of heart block in a patient suffering from this complication of hypertensive cardiovascular disease is shown by means of animated sketches. The anatomy of this specialized system is likewise briefly reviewed. An uncut electrocardiographic record taken during successive typical Adams-Stokes seizures next is shown. The various types of arrhythmias seen are described on inserted titles. Complete heart block is first noted as patient is conscious and rests quietly in bed. Next, occasional premature ventricular beats from various foci occur. They become more frequent and are seen in pairs, then in groups of three and four. As Adams-Stokes seizure comes on, we see recorded a run of typical ventricular tachycardia of the prefibrillary type with a ventricular rate of 240. This passes into ventricular fibrillation. In 42 seconds ventricular tachycardia appears again and as patient emerges from the attack and consciousness is regained, bundle branch block is seen. This is soon replaced by the tracing showing complete heart block. Another attack quickly follows, showing again the prefibrillary type of ventricular tachycardia followed by a long period of ventricular standstill or asystole. This is broken by the occurrence of occasional ectopic beats from focus in septum and these beats gradually become more frequent as the patient emerges from the attack.

In the final section of the film the various types of cardiac irregularities shown by the patient are reproduced in the exposed heart of a dog. Heart block, premature ventricular contractions and, finally, a paroxysm of ventricular tachycardia passing into ventricular fibrillation are seen. These reproductions of the arrhythmias were made in the Laboratory of Pharmacology at the University of Pennsylvania through the courtesy of Dr. Carl Schmidt.

Meeting, December 30, 1938

(Dinner meeting at the University Club: Foster Kennedy, M.D., guest speaker)

SECTION ON MEDICAL HISTORY†

Regular Meeting, December 12, 1938

Annual Students' Program: Symposium on the Development of Endocrinology.

The Parathyroids. Fuller Albright,* M.D.

The Thyroid. I. S. Ravdin, M.D.

The Pituitary. F. D. W. Lukens, M.D.

Illustrative Exhibit of Books and Specimens. Arranged by Eliot R. Clark, M.D., and Balduin Lucké, M.D.

† This Section held 5 meetings during the year, and had an average attendance of 70.

* *By invitation.*

SECTION ON OPHTHALMOLOGY‡[1,2]

Regular Meeting, December 15, 1938

(1) Lupus Erythematosis with Fundus Changes; (2) Essential Shriveling of the Conjunctiva (Ocular Pemphigus); (3) Old Interstitial Keratitis. Joseph V. Klauder,* M.D., and Van M. Ellis,* M.D.

The Production of Corneal Ulcers in the Rabbit. Robb McDonald,* M.D., and Horace Pettit,* M.D.

The Varied Surgical Indications of Ptosis. Edmund B. Spaeth, M.D.

SECTION ON OTOLARYNGOLOGY[3,4]

Meeting, December 13, 1938[5]

Labyrinthine Fistulae. Norton Canfield,* M.D.

Experience with Surgical Fenestration of the External Semicircular Canal for the Improvement of Hearing in Otosclerosis. Julius Lempert,* M.D.

SECTION ON PUBLIC HEALTH, PREVENTIVE AND INDUSTRIAL MEDICINE[6]

Meeting, December 5, 1938

Symposium on Tuberculosis Prevention

What Is Being Done and What I Should Like to See Done to Prevent Tuberculosis:

‡ This Section held 7 meetings during the year, and had an average attendance of 88.

[1] The paper, "Jaw Winking: Marcus-Gunn Phenomenon," was erroneously attributed, in the December, 1938, issue of the *Transactions & Studies*, p. 247, to Dr. Samuel B. Hadden. The author was Dr. Carroll R. Mullen; Dr. Hadden discussed the paper. The editor wishes to apologize for the unfortunate error.

[2] The proceedings of this Section are abstracted in the *American Journal of Ophthalmology* and the *Archives of Ophthalmology*. * *By invitation.*

[3] This Section held 7 meetings during the year, and had an average attendance of 22.

[4] The proceedings of this Section are abstracted in the *Archives of Otolaryngology*.

[5] Joint meeting with the Philadelphia Laryngological Society.

[6] This Section held 4 meetings during the year, and had an average attendance of about 80.

In the Public Schools of Philadelphia. J. Hart Toland,* M.D.

In the College-Age Group. H. D. Lees,* M.D.

In the Industrial Plants of Philadelphia. Charles-Francis Long, M.D.

In New York City. H. R. Edwards,* M.D.

* *By invitation.*

Two Anatomical Fugitive Sheets

In an earlier number of this periodical[1] I referred to two apparently unrecorded anatomical fugitive sheets recently discovered in the library of the College. Interest in the subject of early anatomic illustration is now so general that there exists little reason for hesitating to reproduce these fugitive sheets, which, so far as I have been able to learn, are wholly unknown by sight to the great majority of students of the subject.

Plate I, the female figure, was known in a later version to Dr. Le Roy Crummer, who published it in 1923.[2] Crummer's sheet was printed at Venice, by Sebastiano Combi, in 1611; only the foundation figure was present, however, and the letterpress was in Italian. Our sheet was printed anonymously at Venice, in 1587, and the letterpress is in Latin. The borders of the two sheets (Crummer and College of Physicians) differ, but it seems evident that the same plate, insofar as the figure is concerned, was used for both versions. Our sheet is unique, therefore, in being the only recorded complete copy of the earliest-known edition of this series.

Plate II, the male figure, has never before been reproduced, to the best of my knowledge.

Both sheets emanate, it is clear, from the same press, and one may surmise that they are versions of the Sylvestre de Paris "Adam" and "Eve" figures on the oblong folio sheet headed *viscerum hoc est interiorum corporis humani partium descriptio* and described, but not reproduced, by Frank[3] and, following him, by Crummer.[4]

W. B. McD., 2d

[1] *Transactions & Studies*, 4 ser., vol. 6, no. 1 (June, 1938), p. 60, footnote 1.

[2] *Ann. M. Hist.*, vol. 5, no. 3 (Sept., 1923), *frontispiece* and p. 208 ("Class four, type IV").

[3] "History and bibliography of anatomic illustration . . ." By Ludwig Choulant. Translated and edited by Mortimer Frank. Chicago, Univ. of Chicago press, (cop. 1920). Pages 161–2.

[4] *Op. cit.*, p. 208 ("Class three, type VI").

Plate I. Anatomical Fugitive Sheet, Reproduced from the Original in the Library of the College of Physicians of Philadelphia

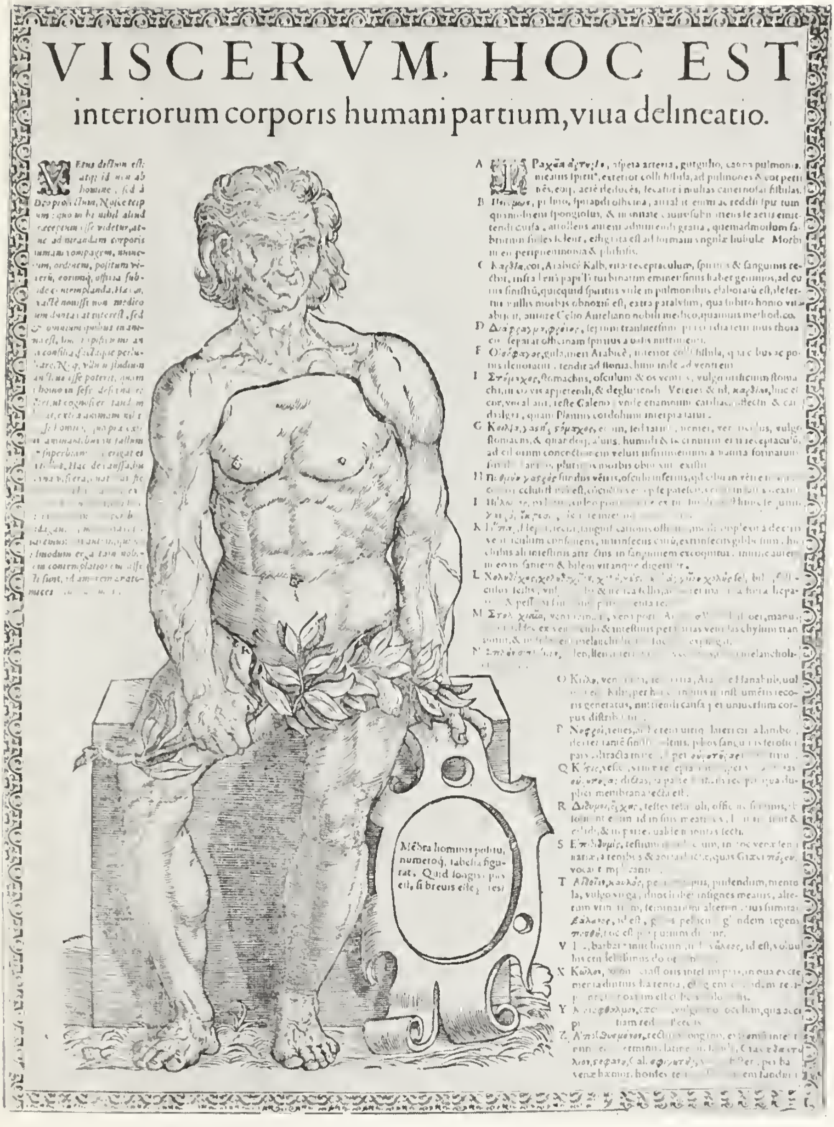

Plate 2. Anatomical Fugitive Sheet, Reproduced from the Original in the Library of the College of Physicians of Philadelphia

Memoir of G. E. de Schweinitz, M.D.*

By John T. Carpenter, M.D.

By the death of George Edmund de Schweinitz on August 22, 1938 after a period of failing health, the College has lost one of its most eminent Fellows, a former president, a life-long, tireless supporter of its revered traditions, a man whose compelling personality exerted an influence for good on all who knew him.

It would be futile in this brief memoir to attempt a complete record of his exceptional achievements. Incredible in their diversity and in their lofty attainment, those achievements will endure so long as the record of a consecrated spirit has power to move the lives of men.

His remarkable success throughout a life dedicated to high ideals George de Schweinitz owes, in no small part, to his heritage of qualities sprung from an ancient line of distinguished ancestors. His father, Bishop Edmund A. de Schweinitz, who in 1844, at the age of nineteen, sailed for Europe and matriculated in the University of Berlin, was the leader in that old community known as the Moravian Church, whose Bethlehem branch was established in Pennsylvania about 1741. His mother, Lydia J. Tschirschky, was of noble Silesian family. His paternal grandfather, Ludwig David Von Schweinitz, a distinguished scholar and renowned botanist, at twenty-five years of age published a volume of 400 pages—"The Fungi of Lusatia"—written in Latin and illustrated by plates drawn and engraved by himself. After his return to the United States, he changed his name to Lewis David de Schweinitz, since adopted by the family, and from his wife, Louise Amelia Ledoux, is derived the Huguenot strain.

George E. de Schweinitz was born October 26, 1858 in Philadelphia, where his father was pastor of the First Moravian

* Read January 4, 1939.

Church, but his boyhood was passed in Bethlehem, to which place the home was moved in 1864.

In the frugal, rigidly upright and intensely intellectual atmosphere of this home he imbibed the high principles, the indefatigable, tireless industry, the determination of character which from the beginning of his medical career assured his success. His classical course at the Moravian College, of which his father was president, gained for him his A.B. when but eighteen years of age, and the evidence of this broad cultural foundation was revealed throughout his life of intellectual attainment. His mother died in 1866, and two years later his father married Isabel Alison Boggs, aunt of the late Dr. Henry R. Wharton, his preceptor. For many years she occupied a sacred place in his life, and he valued her guidance, naming her affectionately, "my literary editor."

From early boyhood, determined upon a medical career, he held firmly to his purpose, and as the necessary funds for his medical course at the University of Pennsylvania were wanting, he taught for two years at the Military Academy at Nazareth, Pennsylvania. While thus occupied, he "read medicine" in the office of the village doctor, and often accompanied him on his rounds, getting an insight by this experience into the life of the old-time country doctor. Provided with means for his medical education, he entered the Medical Department of the University, from which in 1881 he was graduated "first-honor" man, with an average 98.7, and president of his class. The Hodge Medal "for diligence, care and skill in anatomy" was awarded to him with his degree M.D.

From one of his contemporaries in the Medical School, I had a vivid word-picture of de Schweinitz as a medical student—his figure tall, lithe and erect, the clear complexion of a country lad crowned by a head of flaxen hair, keen, blue, penetrating eyes—the image of a young Norse warrior. Among his early intimate friends were Hobart Hare and Edward Martin—the "triumvirate" as they used to be called—and the fun-loving Martin always addressed him as "Heaven-born," which annoyed him no little.

The records of great municipalities prove that the country-bred, vigorous, aggressive and industrious youth, battling where competition is bitter, triumphing over stupendous obstacles usually wins the coveted prize in his particular field of endeavor. This is signally confirmed by the extraordinary success of George de Schweinitz in the field of medicine.

In 1891 began my first association with Dr. de Schweinitz in the Eye Dispensary of the University Hospital, where a large number of out-patients crowded the daily clinic of Dr. Wm. F. Norris, whose staff included Drs. Samuel D. Risley, B. Alexander Randall and George de Schweinitz. The records, then kept in great leather-covered volumes, were a source of inspiration to me, but the notoriously illegible entries in his inimitable handwriting gave me a training second only to the study of Egyptian hieroglyphics—years after, I had "written proof" that, unlike the choice vintage, his writing had not improved with age.

Ophthalmology in Philadelphia furnished ample opportunity for the distinguished talent of George de Schweinitz, and in the first ten years of professional activity, he had not only gained a large and influential private practice, but also honors and posts of great responsibility. His capacity for work was limitless, and we find him filling, with uniform distinction, many positions whose duties called for a wide diversity of accomplishments.

After serving as intern at the Children's Hospital and at the University Hospital 1881–1882, he made a great name among medical students as Quiz-master in therapeutics, 1882–1887, in the Medical Institute of Philadelphia on Woodland Avenue. The laboratory investigations to determine the physiologic action of drugs, undertaken in association with the late Hobart A. Hare for Dr. Horatio C. Wood, required many hours of patient and intensive application. From 1883–1885 he was Prosector of Anatomy for Dr. Joseph Leidy, as well as Surgical Registrar at the University Hospital.

Important among his early appointments was that of Ophthalmologist to the Orthopedic Hospital and Infirmary for Nervous Diseases in 1886. Associated with its great medical staff, Weir Mitchell, Wharton Sinkler, William Osler, Morris Lewis and

Charles Burr, he devoted much attention, as his writings show, to the correlation of the "sister-specialties," neurology and ophthalmology.

His appointment in 1887 as Ophthalmic Surgeon to the Philadelphia General Hospital, and in 1891 as Professor of Ophthalmology at the Philadelphia Polyclinic and College for Graduates in Medicine, made still further demands upon his already fully occupied time. His connection with the University of Pennsylvania began in 1891 under Dr. Wm. F. Norris in the Outpatient Department of the hospital, where his characteristic skill and energy marked his work; and as Lecturer in Medical Ophthalmoscopy in the medical course, where he demonstrated to the students the value of the ophthalmoscope in general medicine.

A signal honor was shown Dr. de Schweinitz when the Jefferson Medical College, in 1892, elected him Clinical Professor of Ophthalmology, and there four years later he became Professor of Ophthalmology, holding this important post until 1902, when his Alma Mater recalled him to succeed Dr. William F. Norris in the Chair of Ophthalmology. During twenty-two years, by his distinguished services, he added to the already well recognized fame of ophthalmic teaching at the University of Pennsylvania.

It was during these years, whose memory I cherish, that as his Chief of Clinic I enjoyed the great privilege of close association in his teaching and operative work, and felt, as did all whose good fortune it was to labor with him, the inspiration of his life and character.

I was most impressed by his untiring devotion to duty, the sterling uprightness of his character, the depth of his knowledge, his accuracy of diagnosis, his complete mastery of details and his astounding memory, revealed in all discussions of ophthalmic subjects. Jealousy or envy had no place in his character, and he was always punctilious in giving full credit to the work of others. He gladly lent the lustre of his name to younger, and as yet unrecognized, aspirants for recognition in the ophthalmic field. His long hours of work were carried far into the night, but seemed to bring no penalty of fatigue. He had no hobby except work,—he seemed to rest by working harder at something different. I remember on one occasion, while lunching with him before leaving for the operative clinic, the conversation had turned to riding and golf, and Mrs. de Schweinitz said to me: "Oh! if you could only teach George to play; he never plays." I believe that in his last years he paid the penalty for this unceasing mental application.

As an operator, Dr. de Schweinitz displayed excellent judgment. He was courageous, thorough and successful, giving no thought of attempting to impress others by a display of rapid or brilliant technique. As a teacher he commanded the attention of his class in his didactic course of lectures, where he revealed his talent for clear, systematic presentation of his subject.

George de Schweinitz may be said to have had at the very beginning a meteoric success, but, unlike the flashing path of the meteor, the curve of his flight led ever upward, and during his entire life we find him the recipient of ever new and ever greater honors. His reputation was not confined to his native land, but he became a prominent figure among foreign leaders in ophthalmology. His work in medical literature brought widespread fame, and his "Text Book on Diseases of the Eye," first published in 1892, held a leading position in this country, passing through five reprints and ten editions, and was recognized in many medical schools as the standard authority. Each new edition was brought fully up to date by the addition of the valuable advances made in the interim in ophthalmology. He contributed voluminously to the literature of his specialty and his "literary activity, accuracy of statement and conscientious fidelity to truth were shown in all that he wrote."

Appended to this memoir is a list of the many honors, hospital appointments, memberships in learned societies and honorary degrees which marked his professional career. It may be incomplete, but it reveals to incredulous minds the rare versatility and the prowess of this great man, the foremost American ophthalmologist of his day.

Let me recapitulate a few of the outstanding honors awarded in recognition of his greatness: 1894—The Alvarenga Prize from the College of Physicians of Philadelphia for his classic monograph on the Toxic Amblyopias. 1923—The Bronze Plaque presented by the Société française d'Ophtalmologie. 1927—The Scientific Research Medal of the Section on Ophthalmology of the American Medical Association. 1928—The Huguenot Cross. 1930—The Dana Medal awarded by the National Society for the Prevention of Blindness, inscribed: "Wise, Learned, Patriotic, Teacher and Guide." 1934—The Howe Medal, by the American Ophthalmological Society, awarded for "character and professional attainments, work in the domain of medical education and of ophthalmic practice and original investigation in the field of ophthalmology." On the roll of honor of recipients of this medal, awarded but ten times, are such names as Ernst Fuchs, Vienna; Priestly Smith, England; Theodore Axenfeld, Germany; Sir John Herbert Parsons, England; Alexander Duane, New York; Edward Jackson, Denver; F. H. Verhoeff, Boston; and Arnold Knapp, New York.

In 1923 he was selected by the Ophthalmological Society of the United Kingdom to deliver the Bowman Lecture at London—the only American ophthalmologist to be thus honored. He chose as his title: "Ocular Aspects, Especially Field Defects, of Pituitary Body Disorders."

In the same year he was invited to address the Société française d'Ophtalmologie, to which he was elected an Honorary Member.

He was chosen president of several important societies during his life, among them the College of Physicians of Philadelphia, 1910–12; the American Ophthalmological Society, 1916; the American Medical Association, 1922; the International Congress of Ophthalmology, 1922.

His most cherished associations were with this College, in which his activities covered more than forty years. He was a founder and a constant supporter of its oldest Section, that of ophthalmology, which held its first meeting in 1893. The American Ophthalmological Society held a place almost equal in his medical activities, and in these two representative organizations he was always an outstanding figure in any group of distinguished Fellows.

As a public speaker he was *facile princeps*. He spoke with resonant and agreeable tone, and with a grace and beauty that charmed his audience. The Fellows of the College present at the ceremonies m ·king the dedication of this building in 1909 remember his eloq ence as toastmaster, and I select, as the most fitting characterization of his own life, from the words he uttered in presenting for Associate Fellowship Dr. O. F. Wadsworth of Boston, the following: "For twenty-two years you labored with conspicuous distinction in the [Harvard] school of medicine; an investigator, you have solved difficult problems in ophthalmologic practice; a clinician, you have been distinguished for the accuracy of your observations and the keenness of your diagnostic insight; a teacher, you have sent forth your students amply equipped for the duties which confronted them, rich in the value of your instructions; an author, you have enriched the annals of American ophthalmic literature; a physician and surgeon, you have uplifted the standard of the profession and become an exemplar among the men of science."

"A sacred burden is this life ye bear,
Look on it, lift it, bear it solemnly.
Stand up and walk beneath it steadfastly,
And onward, upward till the goal ye win."

Are not these words the very essence and epitome of the life of this great teacher and physician, this gentle man, whose memory we hallow on this occasion?

CHRONOLOGICAL SUMMARY

1878—Honorary Degree, A.M., Moravian College
1885—Ophthalmic Surgeon, Children's Hospital
1886–1913—Ophthalmologist, Orthopedic Hospital and Infirmary for Nervous Diseases
1887—Ophthalmic Surgeon, Church Home for Children
1887–1914—Ophthalmic Surgeon, Philadelphia General Hospital
1891–1892—Lecturer on Medical Ophthalmoscopy, University of Pennsylvania
1891–1898—Professor of Ophthalmology, Philadelphia Polyclinic and College for Graduates in Medicine
1892–1896—Clinical Professor of Ophthalmology, Jefferson Medical College
1894—Alvarenga Prize, College of Physicians of Philadelphia
1896–1902—Professor of Ophthalmology, Jefferson Medical College
1896–1897—Chairman, Section on Ophthalmology, American Medical Association
1902–1924—Professor of Ophthalmology, University of Pennsylvania
1910, 1911 and 1912—President, College of Physicians of Philadelphia
1914—Honorary Degree, LL.D., University of Pennsylvania
1916—President, American Ophthalmological Society
1920—Honorary Degree, L.H.D., Moravian College

1922–1923—President, American Medical Association
1922—President, International Congress of Ophthalmology and Chairman, General Committee
1922—Honorary Degree, D.Sc., University of Michigan
1923—Bowman Lecture, Ophthalmological Society of the United Kingdom
1923—Honorary Member, Ophthalmological Society of the United Kingdom
1924—Guest of the Société française d'Ophtalmologie, and Recipient of Bronze Plaque
1924—Honorary Member, Société française d'Ophtalmologie
1924—Professor of Ophthalmology, Graduate School of Medicine, University of Pennsylvania
1924—Trustee, University of Pennsylvania
1927—International Council of Ophthalmology
1927—Scientific Research Medal, Section on Ophthalmology, American Medical Association
1927—Honorary Degree, D.Sc., Harvard University
1928—The Huguenot Cross
1930—The Dana Medal from the National Society for the Prevention of Blindness
1934—Howe Medal, American Ophthalmological Society

Hospital Affiliations, 1890–1927; Consulting Ophthalmic Surgeon, Methodist Episcopal, Philadelphia Polyclinic, Bryn Mawr, Chester County, Orthopedic, Philadelphia General, Wills Eye.

Military Service: First Lieutenant, M.R.C., U. S. A., 1908; Major, M.R.C., U. S. A., 1917; Lieutenant-Colonel, M.C., U. S. A., 1918; Colonel, O.R.C., 1919; Brig. General, Aux. M.R.C., 1927; Surgeon General's Office, Consultant in Ophthalmology; Foreign Service in France; Editorial Board, Medical History of the War; Established and became first Director, School of Ophthalmology, Camp Greenleaf, Fort Oglethorpe, July 1918.

Membership in Medical Societies: American Medical Association, College of Physicians of Philadelphia, American Academy of Ophthalmology and Oto-Laryngology, American Ophthalmological Society, Philadelphia Pathological Society, Philadelphia Neurological Society, Honorary Member, Kansas City Society of Ophthalmology and Oto-Laryngology, 1924, Honorary Fellow, New York Academy of Medicine, 1926, Honorary Fellow, Washington Medical and Surgical Society, 1928, Honorary Member, Belgian Ophthalmological Society, Honorary Member, Hungarian Ophthalmological Society, Honorary Member, Egyptian Ophthalmological Society, Honorary Member, Royal Society of Medicine in London.

Membership in General Societies: Academy of Natural Sciences, 1896; Board of Managers, Pennsylvania Institution for the Instruction of the Blind, 1905; Board of Directors, Library Company of Philadelphia, 1905; American Philosophical Society, 1912; Member of Advisory Committee, National Society for Prevention of Blindness, 1916; Honorary Vice-President, National Society for Prevention of Blindness, 1935

Contributions to Medical Literature: Diseases of the Eye, 1892. (Ten editions); Toxic Amblyopias, 1896; American Text-book of Diseases of the Eye, Ear, Nose and Throat (co-author), 1899; Haab's Atlas of External Diseases of the Eye (American editor), 1899; Haab's Atlas and Epitome of Ophthalmoscopy and Ophthalmoscopic Diagnosis (American editor), 1901; Haab's Atlas and Epitome of Operative Ophthalmology (American editor), 1905; Ophthalmic Year Book (co-author), 1905–1908; Pulsating Exophthalmos (co-author), 1908; numerous articles and monographs in medical and ophthalmological journals.

Memoir of Edward Martin, M.D.*

By William J. Mayo, M.D.

Edward Martin, the son of Jonathan Willis Martin and Malvina Register Martin, was born in Philadelphia August 14, 1859, and died in Philadelphia March 17, 1938.

He received his early education in private schools and in the public grammar and high schools of Philadelphia. He graduated from Swarthmore College with the degree of Bachelor of Arts in 1878, and in that year entered the Medical School of the University of Pennsylvania, from which he graduated with the degree of Doctor of Medicine in 1883. In June, 1883, Dr. Martin became resident physician of the University Hospital. In 1887, he was married to Miss Anna Withers, of Philadelphia, who died November 9, 1937.

Talented, indefatigable, kind, a man of great versatility, with medicine his chosen field, Edward Martin accomplished much. He had a keen sense of civic responsibility, was deeply interested in education for the people, and was zealous in promoting sanitation and public health. He served with distinction in the Medical Corps of the United States Army during the Great War. He received well deserved honors from Swarthmore College and the University of Pennsylvania and other institutions of learning, from medical and surgical associations at home and abroad, from the city of his birth, and from his country.

At the close of a man's life, to estimate his worth it is wise to see him in relation to his life surroundings, to know not only the part he played as an individual, but also as a component part of the great events to which he contributed in the betterment of mankind.

* Read by the Secretary of the College, January 4, 1939.

Philadelphia, from the very beginning in this country has maintained a high grade of scholarship, especially in medical education. Space permits the merest reference to the contributions of Philadephians to scientific advancement which were not only American but were world-wide in their scope.

Up to the time when the new understanding of the causation of disease began to come in, Samuel David Gross of Philadelphia was the prominent figure and personified the highlight of surgical achievement. I take the name of Gross because he so ably represented American surgery of his time, combining as he did skill in operating with rare understanding of clinical medicine, upon which surgery is based, which made him the outstanding teacher of his day, by example and precept and by the written word.

The acceptance of the germ theory of disease was destined in fifty years to bring about greater advancement in medicine and surgery than had been made in all previous recorded history. The eighties in medicine saw the end of the surgery of the pre-antiseptic period and the slow development of the new era initiated by Pasteur and Lister.

During the formative years of the nineties, Dr. Edward Martin was an exponent of the new knowledge. We see him changing enthusiastically but not recklessly from the old to the new, in his teaching careful to use the development of clinical medicine as the background for the application of the new, wisely judging, adapting, and applying advances in knowledge as they were brought out the world over. As a lecturer, he displayed a type of humor which was a joy to his hearers and an effective means of driving home commonly known principles of scientific medicine as well as the new knowledge of surgery.

Among the best of Dr. Martin's many excellent professional attributes were his thorough understanding of anatomy, physiology, and chemistry, which in clinical medicine he related to the examination of the patient and to the case history, and his habit of not neglecting the special senses in making his deductions from the findings. He recognized that the highly scientific development of this mechanistic age had led perhaps to some loss in appreciation of the individuality of the patient and to trusting largely to the laboratories and outside agencies which tended to make the patient not the hub of the wheel, but a spoke.

One of the greatest of the teachers of his time was J. William White, Professor of Surgery at the University of Pennsylvania, with whom Edward Martin was associated for many years. I think that the influence of Professor White on Martin perhaps had much to do with developing those qualities of mind and heart which made Martin loved for his humanities and social concept as well as for his splendid abilities and his illuminating clinical teaching of surgery.

If one goes over the history of the learned surgical societies in this country and reviews the contributions to American surgery, one can well understand the high place that Edward Martin attained in the years of his activity. He was one of the leaders in the American College of Surgeons, which had for its object to make certain that there were sufficient trained surgeons to take care of the people of the United States, and to perfect a method whereby such surgeons might become recognized in their communities. In accomplishing this dual purpose, Martin and his fellow workers strove not to develop merely a society for the elect, but one which had for its fundamental principle the development of the best and most reliable men in every quarter of the United States. Dr. Martin's position in the University of Pennsylvania, in the City of Philadelphia, and in American medicine gave special force to his endorsement of this augmentation and extension of medical education and of service to the people in time of need.

Edward Martin desired above all things to be useful to the profession he loved. In the sense of service to medicine and to the people, he did not retire as age advanced, but to the end he maintained his interest in scientific and humanitarian medicine.

My brother, Dr. Charles H. Mayo, and I join with others who knew and valued Dr. Martin in paying tribute to an esteemed colleague and dear friend.

President's Address*

By George P. Muller, M.D.

The ordinances and by-laws of the College require the president in an annual address to present to the Fellows the affairs of the College.

The total Fellowship of the College on December 27th, 1938 was 685, composed as follows:

Resident Fellows	627
Non-resident Fellows	46
Honorary Fellows (Foreign)	5
Honorary Fellows (American)	7

During the year there were elected 21 new Resident Fellows. There were 2 resignations, and 2 Fellows were dropped for non-payment of dues.

We lost 18 Fellows through death. At the request of the Censors memoirs have been, or will be, presented of Drs. Michael A. Burns, Edward Martin, R. Tait McKenzie, Lawrence F. Flick, George E. de Schweinitz, J. Norman Henry, John H. Girvin, Addinell Hewson, Floyd E. Keene, and Benjamin F. Baer.

William F. Moore died suddenly from heart disease on April 25th, 1938. He was fifty-seven years old, had graduated in medicine from the University of Pennsylvania in 1905, and at the time of his death was assistant professor of bronchoscopy and esophagoscopy at the Graduate School of Medicine, University of Pennsylvania, and bronchoscopist to the Philadelphia General, Episcopal and Children's Hospitals. He was one of that band of efficient men trained by Chevalier Jackson and had a very lovable character.

Courtland Yardley White died January 14th, 1938, also

* Read January 9th, 1939.

of heart disease. He was sixty-four years old and was internationally known as an authority on bacteriology and pathology, and was city bacteriologist and chief of the division of laboratories of the city's Department of Health. He was placed in charge of the city laboratories at the Philadelphia Hospital for Contagious Diseases in 1910, and devoted most of his time to extending and developing these laboratories. He graduated from the Medical School of the University of Pennsylvania in 1895 and later was closely associated with the Pepper Laboratory of Clinical Medicine and the Henry Phipps Institute. At various times he was connected with the Episcopal, Children's, St. Joseph's and Jewish Hospitals and the Veterinary Department of the University of Pennsylvania. At the time of his death he was associate professor of medicine in the Graduate School of Medicine of the University.

Ross V. Patterson died May 2nd, 1938, from cerebral thrombosis, at the age of sixty. He graduated from the Jefferson Medical College in 1904 and early became interested in medical education, serving as Sub-dean of Jefferson Medical College from 1906 to 1916 and as Dean from 1916 until his death. In 1934 he became Sutherland M. Prevost Professor of Therapeutics and held the Chair at the time of his death. He received honorary degrees from La Salle College, Colgate University, Ursinus College, and Wake Forest College. He was a president of the State Medical Society (1930–31) and of the Association of American Medical Colleges (1933–35). He spent virtually his entire career in the Jefferson Medical College and Hospital and at his death willed his considerable estate to Jefferson.

John Clement Heisler died from heart disease on September 9th, 1938. He graduated from the Philadelphia College of Pharmacy in 1883 and from the Medical School of the University of Pennsylvania in 1887. He was always a practitioner of medicine and yet essentially he was an anatomist, beginning as a prosector to the chair of anatomy of the University of Pennsylvania Medical School, 1888–1897, and being at intervals assistant demonstrator of anatomy and curator of the Wistar and Horner Museum, University of Pennsylvania; instructor in diseases of the chest in the Polyclinic Hospital, Philadelphia; professor of anatomy in the Medico-Chirurgical College of Philadelphia, 1897–1916; and professor of anatomy, University of Pennsylvania Medical School, from 1916 to 1930, when he retired.

Charles Baum died of coronary occlusion at the age of eighty-three in Middletown, Pa., on October 27th, 1938. He graduated from the Medical School of the University of Pennsylvania in 1877. He received a Ph.D. degree from the University in 1878, but I have been unable to find the title of his thesis. The only information I have been able to obtain about Dr. Baum is that he practiced general medicine at 1828 Wallace Street for many years and this was his address when he was elected to the College in January, 1883. He is listed as being a member of the Examining Board of the United States Army. For many years he was president of the Board of Trustees of Gettysburg College. Some years ago he retired and lived at Middletown where he was born.

Dr. Philip S. Stout died on November 3rd, 1938, from heart disease. He graduated from the University of Pennsylvania in 1904 and shortly began to specialize in otolaryngology. At the time of his death he was associate professor of otolaryngology in the Graduate School of the University of Pennsylvania. Dr. Stout's ancestors came to this country in the early part of the eighteenth century and were among the first settlers in Bucks County. He was particularly interested in the Boy Scouts and in the Masonic Order.

Dr. George W. Pfromm died on December 4th, 1938, at the age of sixty-nine. He graduated from the old Philadelphia College of Pharmacy and in 1894 from the Medico-Chirurgical Medical College. He then went abroad to study in Berlin and Vienna and upon his return entered the faculty of the Medico-Chirurgical College. In 1904 he was appointed assistant professor of therapeutics and in 1905–06 served as clinical professor of therapeutics. He was on the staff of the American Stomach Hospital and was Consulting Physician to the Germantown Protestant Hospital for the Aged.

Dr. Frederick J. Kalteyer died on December 20th, 1938. He was born in San Antonio, Texas, and graduated from the Jefferson Medical College in 1899. He was an interne in the Lankenau Hospital and in 1905 became associated with the Jefferson Medical College, with which he was associated for thirty-three years. At the time of his death he was clinical professor of medicine at the Jefferson Medical College, physician to the Philadelphia General Hospital, and consulting physician to the Delaware County Hospital.

The Special College Privilege group varies from time to time, as its membership comprises mostly graduate students temporarily residing in this city. At the present time the number of members is 18. For the information of the Fellows I am stating what classes constitute this group: (1) the holder of a degree in medicine from a reputable medical college, who has received such degree too recently to be eligible for any class of Fellowship; or (2) a physician pursuing post-graduate studies in a reputable medical school in Philadelphia; or (3) a physician of the Medical Corps of the U. S. Army or Navy or National Health Service, while officially stationed in Philadelphia or vicinity; or (4) a person who, not having received a degree in medicine, is actively engaged in the teaching of, or research in, medicine or kindred subjects.

The number of persons in each class is limited as the Council may from time to time determine. The privileges do not include that of attendance at the Business Meetings or the right to hold office. These privileges automatically cease, in the case of class 1, at the end of the fifth full calendar year following the receipt of the member's medical degree; of class 2, on the termination of his post-graduate studies in Philadelphia; of class 3, on the termination of his official duty at Philadelphia or vicinity.

The Council has continued its careful scrutiny of candidates to be submitted to the College and does this partly by its own knowledge of the candidate and also by an investigation on the part of Council's Membership Committee. The Council regrets that sometimes a favorable recommendation of a candidate is reversed by the College although rarely does a Fellow send in information to the Council which might prevent this humiliation of the candidate.

The Program Committee, under the Chairmanship of Dr. Edward Bortz, and the Committees in charge of the various Foundation Lectures submitted a program of eight lectures of the very highest caliber. In 1937 the average attendance was 221 with a high of 325 and a low of 80. Last year the average attendance was 326, with a high of 550 and a low of 121. Apparently, therefore, these lectures have attracted the attention of the physicians generally, although I regret to record that the average attendance of the Fellows was 47, practically the same as last year.

Last year the Council authorized the giving of three lectures during the present season, open to the general public. The first of these was given on Friday evening, November 18th, by Dr. Alfred Stengel, on the subject—"Currents and Counter-currents in the Progress of Medicine". This lecture was perfectly presented, most informative, and highly enjoyed by the audience present, although the number of this audience left much to be desired. I will attempt the second lecture on January 20th, and the third will be given in April by Dr. Bond. If we find that they do not attract public attention and attendance this activity can be abandoned.

The finances of the College, while apparently in excellent condition, are hazardous by reason of the uncertainty surrounding some of the investments. The Finance Committee, the Treasurer, and the various Committees needing money have come to an agreement which balances the budget for this year if our income is as anticipated.

In our principle account there are trust funds amounting to $576,780.39 and in our Reserve, $52,189.32. Our income last year was approximately $64,170—which is about $3000 less than in the previous year. A large percentage of the total income is "earmarked", particularly for the use of the library. Our particular peril is due to the fact that in years past a large part of the funds of the College were put in railroad bonds, then considered the safest of investments. For reasons that you are familiar with this is no longer true and the Finance Committee has the difficult task of changing these investments with the least possible loss to the College. In my opinion, it is income that matters most to us and not shrinkage in gross value. Then, the property at Thirteenth and Locust Streets continues to be a source of trouble to the College, but does pay an income after payment of taxes, and as real estate has reached its bottom values we may hope to realize on this property in the future.

To offset our losses the College has received two bequests, $10,000 from the Estate of Dr. Charles H. Vinton, and $50,000 from the Estate of Mr. Arthur Lea.

I have two suggestions to make regarding the finances of the College. We should ask our legal counsel to study the matter of grouping all of the various funds and trusts into one fund so that the Finance Committee could better arrange the annual budget. I understand that both at the University and at Jefferson this has been done. And then, we should inquire into the cost of employing an investment councillor who would at all times have an eye on our investments and advise the Finance Committee when to sell and what to buy. Our present advisors, while competent enough, act entirely in a voluntary capacity and we cannot expect the service we would like without paying for it.

The pride and glory of the College is its library, wherein we have 150,033 accessioned items, and 309,177 unaccessioned items. I will leave the definition of these terms to the report of the Library Committee. We receive 1184 periodicals. Sometimes in looking over the list of new books I have wondered why they were acquired, but the following quotation from the report of the Library Committee is informative: "There is, in brief, the need to watch the trends in medical investigation, so as to anticipate (and if possible, stimulate) demands, as well as satisfy them when made. We have to consider the needs not only of the general practitioner and the medical and surgical specialists, but also those of a host of workers in channels contributing to the main stream. We have, finally, to see that the fruits of the past are not lost in the turbulent and self-centered currents of the present.

We have to attempt the impossible—to be all things to all men working in the medical sciences."

Once more I must refer to the generosity of the "Friends of the Library", the unofficial organization founded and inspired by Dr. Burr, whereby books, otherwise unobtainable by reason of cost, are added to the library. I regret to note that the "Fugitive Leaves" ceased with the March (1938) issue. These delightful little journeys into the by-ways of the library, written by Mr. McDaniel, were a source of joy to all who read them. Another evidence of the functioning of the library was the exhibition at various times of books illustrating phases of medical history, such as early works on plastic surgery and on the development of our knowledge of respiration. They attracted a great deal of interest and it would be worth while for the Fellows to attend the meetings of the Section on Medical History if only to see these exhibitions.

The number of library visitors during 1938 exceeded that of 1937 by about 600. The use of the photostat doubled in 1938 as compared to 1937.

Prior to 1933 the Transactions of the College were issued as an annual bound volume and simply represented a publication of the papers read and a printing of much of the "business" of the College. In 1933 the format was changed and the Transactions was issued annually in two unbound numbers. This was done in the interest of economy. In 1938 a further change was made and the Transactions, now called "Transactions and Studies", began a series having four numbers each year. We might offer three major reasons for this change: (1) the lectures given at each of the eight meetings are usually of great scientific value and yet the attendance of Fellows is small. Now all of the Fellows have the opportunity of reading those addresses which the Publication Committee considers of especial merit; (2) the issue of four numbers reduces to a minimum the time between the delivery and the publication of the papers; and (3) the College and its library are able to exert a kinetic rather than a static influence by presenting the College's rich heritage of cultural material. The College can well express its indebtedness to Mr. McDaniel, the librarian, for the scholarly inspiration behind the contents of these Transactions and Studies. The Publication Committee is certainly serving us well in this endeavor.

The Hall Committee reports that the building generally is in sound condition. Considerable attention will be given to the roof this year and, as funds permit, it will be entirely renovated. A factual account of the activities of this Committee is contained in the reports of the Superintendent and is available to any interested Fellow. The garden has remained somewhat of a problem, but the Women's Committee has made progress and much may be expected this year. The room on the right of the entrance hall, still termed the President's Room, has been temporarily fixed up by our own staff, and is in use for the meetings of the Council. We have now $650 contributed towards "setting-up" this room but need about $1200 to make a good start.

The Committees on the Mütter Museum and on the College Collections report a number of additional gifts to enhance these collections. There is need for a special donation of a few hundred dollars to refurbish the oil paintings of our gallery.

I can announce that the Alvarenga Prize for 1938 was awarded July 14th, 1938, to Dr. Richard Shope, of the Rockefeller Institute for Medical Research. His brilliant researches on the "Etiology and Epidemiology of Influenza" can be considered among the most noted contributions to medical investigation in recent years.

I can also report that all of the Sections of the College have been active and have had meritorious programs. They represent the outlet for clinical and scientific reports by Fellows of the College.

And finally, a word about the Committee on Public Health, Preventive Medicine and Public Relations. It has seemed best to have this Committee work in close coöperation with the similar committee of the County Medical Society which is headed by Dr. Joseph Stokes, Jr., a Fellow of the College. A sub-committee of both groups made an investigation of the conditions in Byberry Hospital of Philadelphia and prepared a report and list of recommendations for improvement of this hospital. This report was said to be of greatest importance and weight to a Committee appointed by the Governor and headed by Senator Shapiro, whose subsequent report led to the transfer of Byberry Hospital to the State Mental Hospital system.

Similarly, the two groups drew up recommendations for the City Charter Revision Committee of Philadelphia relative to certain medical problems, namely: (a) the Department of Health; (b) the qualifications of a Director of Health; (c) powers of the Health Department; (d) the Department of Medical and Social Welfare; (e) Hospital Board of Department of Medical and Social Welfare. The combined Committees also submitted a recommendation to the Acting Director of Health of Philadelphia to support the City Committee for the Study and Control of Pneumonia in their request for $25,000 to inaugurate an adequate campaign for the control of pneumonia in Philadelphia.

The Section on Public Health, Preventive and Industrial Medicine held three meetings during the past year and the programs were on Air Pollution, Group Hospitalization, and Pellagra, respectively. There was a better attendance than in the previous year, but the average was only about sixty. Perhaps it might be well if this Section advertised their meetings by placards in the hospitals and by newspaper announcement, but in this event the program should consist of matters of public interest and not of purely medical technic, and floor discussion of controversial subjects should be carefully guarded against. It might be that interest in this Section could be stimulated by a small grant from the College funds to enable them, say once a year, to pay the expenses of a speaker who might have a special message on the public health.

And so, just as last year, I can report that generally this year the College has prospered, has a balanced budget, and hopes for the future. The College is indebted to the Officers, the Council, and the Committees for hard work done in its service.

Report of the Library Committee*

It is sometimes said by "praisers of the good old days" that even the pleasure of using libraries is not what it used to be. There is some truth to the charge. But let us rather say that the use most of us make of libraries is not what it once was. Like every other institution that survives from one generation to another, the library alters its character to meet the changing needs of its users. The large, specialized library is, today, less a resort for the desultory reader than a kind of laboratory.

Now, a laboratory may contain many men working on closely-related problems, yet the essential apparatus required by one man may be of no use to his colleagues. But if the desired end-product is to be obtained—nor should it be forgotten that the by-products themselves may be of genuine value—each worker must have at his disposal the essential apparatus for his work.

The problem of supplying each worker in the bibliographic laboratory with his essential apparatus is the problem of the large medical library. It is one not so easy of solution as it used to be. It is a trick, to use a popular expression, that needs to be done with mirrors. A rapidly contracting world, paradoxically enough, brings a constant widening of our horizons.

No longer do we fulfill our function if we confine our purchases to the outstanding contemporary medical books, pamphlets, and periodicals of our land and of a corner of Europe. Though of the making of books there is no end, their relative importance in scientific pursuits decreases as the means of communication are speeded up. The pamphlet is obsolete, or nearly so. Today, the periodical is king. (Tomorrow, will it give way to the micro-film?) The small corner of Europe no longer dominates our extra-territorial interests. The whole so-called civilized world

* October 16, 1937–October 15, 1938. The Annual Reports from this library have customarily been based on the corresponding yearly period.

is at work on the problems that engage us; and we Americans, perhaps above all other peoples, have adopted the concept of the universal significance of scientific investigation. A glance at the provenances of our periodicals will reveal how far afield the medical library must go, if the users of its laboratory are to have the checks and balances—not to mention word of fields newly opened-up—they rightfully demand.

Books, and to some extent, pamphlets, must still be acquired, in addition to the ever multiplying periodicals. The day of the "systematists" is past, of course, given the quietus by the spectacular rise of the specialists. These, in turn, are beginning to find life made uncomfortable by the rise of pathologic concepts and diagnostic procedures not only undreamed of in their philosophy, but demanding, for their comprehension, expert training not easily acquired by one fully occupied with a flourishing practice. Medicine could indeed be said to have the reproductive character of the amoeba, if the relationship between mother and daughters were only more transparent.

The fact that medicine has, in a sense, adopted as its own the Terentian concept, "Nothing having to do with human kind do I regard as alien to me", means that the responsibilities of the medical library have been increased. Legitimate disciplines which once figured but little in medical thought now are become more closely related—as, for instance, psychology, physical education. Our modern concept of the library's obligations requires that we not ignore the eccentric, even the wholly repugnant, pseudo-medical "isms" of the present or of the past. Of recent years the relationship of medicine to society has undergone intensive investigation. All these new fields of interest have, of course, their own bodies of literature, from which an attempt must be made to discern and obtain the best.

Insofar as the work of man is concerned, control of the future demands not only knowledge of present means, but an historical perspective. This cannot be gained without adequate records of the past. We must know the problems our predecessors faced; the means they adopted to meet them; we must know the men themselves. The longest view may very well show the shortest road to a long-sought destination. Under the rather inadequate term *cultural medicine* it is customary to inter all the experience and wisdom of the past. One of the functions of the large medical library is to obtain and preserve these records for those who, now and later, may be trusted to make wise use of this heritage.

We have attempted to indicate the situation with which a medical library has to cope today. There is, in brief, the need to watch the trends in medical investigation, so as to anticipate (and, if possible, stimulate) demands, as well as satisfy them when made. We have to consider the needs not only of the general practitioner and the medical and surgical specialists, but also those of a host of workers in channels contributing to the main stream. We have, finally, to see that the fruits of the past are not lost in the turbulent and self-centered currents of the present. We have to attempt the impossible—to be all things to all men working in the medical sciences.

Though these truths are self-evident, if one goes in search of them, they do not necessarily present themselves on a mere reading of a report couched in numerical terms. It is well to remind ourselves, therefore, of the multiplicity of specialized interests reflected in the "acquisitions and accessions" so summarily dealt with in the usual "report"; well to remind ourselves, also, that the mortality of medical interests is far surpassed by their birth-rate.

It is to the use made of the library—the number of readers, the number of books circulated, the calls for material not in the library—that we must go for some indication of the results of our efforts to meet our problems. Though this use is conditioned by a number of factors obviously unrelated to the point at issue, and the evidence must not be regarded as conclusive even for the given year, it affords us an immediate check that is not without authority. With these reservations in mind, we may, nonetheless, reasonably feel some gratification at the advances made during the past year. The number of visitors (both Fellows and non-Fellows) increased, and with it the number of books circulated. Particularly remarkable is the greatly increased attendance in the Current-periodicals Room. Among the probable reasons for this are the additions made in the last year or two to the list of current periodicals (not always newly instituted publications) regularly received. On the other hand, the resignation of our assistant cataloguer in mid-summer, coupled with the summer-long diminution in help occasioned by the usual vacations, served to reduce considerably the number of volumes accessioned, affecting chiefly the large number of periodicals customarily bound and accessioned during the summer.

Following a custom established some years ago, specific requests for, and recommendations of, books and periodicals were promptly acted upon, the publications being acquired if funds permitted and no other imperative consideration intervened. Readers who ask for material not in the library are informed of the possibility of borrowing it as an inter-library loan or of obtaining it on microfilm. Some indication of how relatively few are the urgent calls that the library cannot satisfy from its own resources is contained in the figures under the heading *Inter-Library Loans* below. And of the 18 volumes recorded there as having been borrowed from other libraries, at least 3 were borrowed for our own use. Our failures to meet demands seem to occur most frequently in the field of foreign periodicals, especially those of Russia, Japan, and South America. Here our selection has to be more severely restricted than we would like because of the obvious necessity of considering the relative value of these periodicals to the greater number of our readers.

Certain auxiliary services, the photostat in particular, made rapid strides ahead in point of general usefulness. Two factors were chiefly responsible for the increased use of the photostat: two or three large institutional orders, and a series of advertisements of the service run in the *Weekly Roster*. The College notices regularly reminded the Fellows of Mrs. Moore's availability for bibliographical research work, and it is gratifying to report that advantage is increasingly being taken of this important service.

The library benefited during the year by receiving its first income from a bequest of approximately $10,000 from a late Fellow, Dr. Charles H. Vinton. This much-appreciated additional income was, unfortunately, more than offset by reduced income from other endowed funds of the library. While we were not obliged to curtail standing subscriptions to periodicals, few new ones could be added, the purchase of books was of necessity somewhat curtailed, and progress in the completing of back files of periodicals and in the repair of valuable books came practically to a standstill.

On the whole, and despite the obstacles enumerated above, there seems reason to believe that the library fulfilled a respectable measure of its obligations. But in a world whose dynamo is speeded up to an unparalleled production of energy, it is less possible than ever before to indulge in any mood of complacency. While unreflective movement continues to be no part of our creed, it is still true that no movement at all is movement backward. Well-considered progress depends chiefly, in the case of the library as in most other cases, on so material an object as available funds. Even minimum growth makes demands which now severely strain our present funds. Though the character of the use made of the library may have—has, in fact—changed, it is inconceivable that the library's present beneficiaries do not also number among themselves those willing and able, like the benefactors of the past, to help assure the continuance of a good deed in a naughty world.

Inventory			*1938*	*1937*
Total number of accessioned items[1]			150,033	147,991
	1938	*1937*		
Incunabula	409	409[2]		
Manuscripts	524	517		
Other items[3]	149,100	147,065[2]		
	150,033	147,991		
Total number of unaccessioned items[4]			309,177	302,855

[1] An accessioned item may be any kind of graphic material that is kept within covers, whether these be made commercially or in the library, of paper or of more durable material. The accessioned item might comprise, for instance, part of a book, or one or more books; a complete part of a periodical volume, or one or more complete periodical volumes; reports, pamphlets, or theses, single or collected; an atlas or photograph album.

[2] Revision of the corresponding figure in the 1937 Report.

[3] Including 48 rare books (as compared with 17 last year).

[4] While the accessioned items contain some material in paper covers, it should be noted that many Reports and Transactions, pamphlets, and theses, also paper covered, are not accessioned, but might be at any time, if any intrinsic reason for so doing should present itself.

	1938	1937		
Reports and Transactions	25,411	25,310		
Periodicals "reserve" (volumes more or less complete[5])	4,594	4,576		
More or less complete volumes of other periodicals not regularly received	3,053	3,132		
Theses and Dissertations	41,117	37,364		
Pamphlets (less than 100 pages)	235,002	232,475		
	309,177	302,855		
Total number of current periodical publications regularly received			1,184	1,151
Duplicate books			11,775	11,692
Portraits[6]			35,598	33,514

Distribution of This Material

	Accessioned items	Unaccessioned items
General Library (including the Lewis Library)	145,823	309,173
On permanent deposit:		
Gross Library	3,797	4
Parry Library of the Obstetrical Society of Philadelphia	217	0
Mütter Museum[7]	196	0
	150,033	309,177

Current Periodicals

Total number of periodicals regularly received in the library: 1,184 titles

	Purchase	Exchange	Gratis	Annuals & 'Books'[8]	Total
American (United States)	131	61	168	46	406
Australia and New Zealand	1	3	2	1	7
Belgium	13	7	1	0	21
British Isles	74	18	7	10	109
Canada	1	7	6	1	15
Ceylon and India	2	7	2	2	13
Cuba and Porto Rico	0	5	6	0	11
France and Colonies	112	17	7	5	141
Germany and Austria	154	1	1	27	183
Italy	76	20	5	0	101

[5] Duplicates of important and much-used periodicals.

[6] Including 101 oil and 429 other, framed portraits in the care of the Committee on College Collections. The count of portraits represents the number of entries on the cards in the portrait catalogue. The entries represent, in turn, both loose portraits and those in books.

[7] The books of the Mütter Museum are not permitted to be removed from the College building.

[8] This column includes (a) Periodicals issued annually or still less frequently; (b) Serials, of various "frequencies," issued in "bound" form (boards or cloth), which are therefore accessioned on receipt and counted also in the inventory of accessioned items:—e.g., Transactions, Proceedings, etc., but not Annual Reports, Monographs, nor Reprint collections.

	Purchase	Exchange	Gratis	Annuals & 'Books'	Total
Japan, Korea, Manchoukuo	5	16	2	6	29
Mexico and Guatemala	0	4	2	0	6
Netherlands and East Indies	10	1	2	0	13
Russia	2	5	3	0	10
Scandinavia (Denmark, Finland, Norway, Sweden)	13	4	0	3	20
South America	4	20	13	4	41
Spain	0	1	0	0	1
Switzerland	21	2	2	0	25
Miscellaneous[9]	3	20	6	3	32
Totals, 1938	622	219	235	108	1,184
(Annuals & 'Books')	40	33	35	108	
Grand Totals, 1938	662	252	270		1,184
Totals, 1937	635	262	254		1,151

These figures give the number of only those publications received regularly and currently. One or more numbers of 141 other journals, also, were added to the files during the past year, scattered issues having been received by donation. Still another group of some 23 publications irregularly issued (most of them at intervals of 2 to 5 years), not received during the past 12 months ending October 15, are omitted from the census.

The statistical increase of 33 in the total number of periodicals, over the 1937 figure, should be interpreted in the light of the following considerations: (a) that 43 journals "current" a year ago are not now being received in the library[10]; (b) that 51 new titles were added to the list; and (c) that the fluctuations of the class of "irregular" publications (issued at longer than yearly intervals) have their usual effect on the total number—that of making it a less simple calculation than the subtraction of "lapsed" and "ceased" titles from "new" titles. Receipt of a number of these "irregulars" which this year "lapsed" will with little doubt be resumed during 1939.

New titles: Of the 51 publications added during the year, 24 are received by purchase; 3, by exchange; 24, gratis. Twenty-five of these are journals which have recently (1936–1938) begun publication and are now on file from the first number issued.

Number of separate issues received and filed: 14,888 (exclusive of duplicates, 7,006, and of reserves, 538). Of the total number, 1,993 were scattered issues received from Fellows and other donors; and 90 others were previously-missing back numbers, supplied by publishers or editors in response to claims, completing 28 volumes, and partly completing 27 other volumes.

Back files of 5 publications were purchased: 11 complete volumes.

The number of visitors to the Current-periodicals Room during the year was (approximately) 6500—an increase of 900 over the number recorded for the preceding year.

[9] Fewer than 5 each, from: British Africa, China, Czechoslovakia, Egypt, Estonia, Greece, Hungary, Jugoslavia, Lithuania, Philippines, Poland, Roumania, Syria.

[10] Six of these 43 are known to have ceased publication, and the same is very likely true of others from which no reply to our inquiries has been received; several annuals (published once each calendar year) have apparently not yet (October 15) been issued in 1938; others are journals with which we had offered to establish an exchange, and which sent us copies regularly for a time although they never replied by letter to our offer and therefore were not sent the College's *Transactions*.

Readers' Use of the Library

Library hours: the library was regularly open daily, except Sunday, from 9 to 6; on Wednesday and Friday evenings, until 9:30. From June 15 to September 7, incl., the library was open Mondays to Fridays, incl., from 9 to 4, and closed on Saturdays. The library was closed, as usual, on the following legal holidays: Thanksgiving, Christmas, New Year's, and Memorial Days, July 4, Labor Day.

			Visitors		*Fellows*		*Total*	
	1938	*1937*	*1938*	*1937*	*1938*	*1937*	*1938*	*1937*
Number of visitors:								
Days.......	(294)	(290)	9,038	8,842	2,069	2,041	11,107	10,883
Evenings....	(77)	(62)	1,288	1,018	217	162	1,505	1,180
			10,326	9,860	2,286	2,203	12,612	12,063

Circulation of books:

	1938	*1937*
Number of volumes taken out...............................	7,448	6,333
Number of volumes consulted in the library..................	49,038	48,572

The number of volumes "consulted in the library" includes only those supplied on demand. Readers have access to the bound volumes of periodicals and works of reference kept on the shelves in the Reading Room; the Fellows of the College, and occasionally others, by special permission, have access to the book-stacks. There are, therefore, many volumes consulted of which no accurate record can be kept.

Inter-library loans: The library has sent sixty-six bound volumes on inter-library loan to seventeen libraries, representing nine states in the Union, and has borrowed on the same terms eighteen volumes from two libraries. As happens each year, a number of requests for books on the restricted list had to be refused. In most of these cases the need was met by supplying photostatic copies of relevant parts of the book.

Use of the study rooms: Number of volumes used in these rooms during the year, 576 (1937: 1,415).

Photostats: 312 prints have been furnished to Fellows (1937: 183); 807 prints to other than Fellows (1937: 370); 1,306 prints to the library. The last include copies of two incunabula (bringing the total of photostated incunabula to 313), portraits, rare books on loan, etc.

Acquisitions and Accessions

Received from all sources:

1938: 2,524 volumes (including the bound and accessioned volumes of periodicals, 139 unbound reports and 343 duplicates); 4,570 pamphlets; 5,776 theses; 22,432 numbers of various journals.

1937: 3,214 volumes (including the bound and accessioned volumes of periodicals, 177 unbound reports and 561 duplicates); 2,741 pamphlets; 5,181 theses; 20,389 numbers of various journals.

Accessions:

1938: 2,042 volumes (1,050 by purchase; 641 by gift; 351 by exchange).
(Books, 678; Periodicals, 1,364).

1937: 2,476 volumes (1,538 by purchase; 554 by gift; 384 by exchange).
(Books, 782; Periodicals, 1,694).

Donations

The individual donors for the past year number 310 (1937: 316).

The library is indebted for large gifts of books, pamphlets and unbound periodicals to the following donors:

Drs. B. M. Anspach, Carl Bachman; P. Blakiston's Son & Co.; Drs. C. W. Burr, Burton Chance, S. Solis Cohen, A. A. Eshner, C. J. Gamble, J. P. C. Griffith, Chevalier Jackson; Sister Marie Koch, Dr. E. B. Krumbhaar, Mrs. H. R. M. Landis, J. B. Lippincott Co., Dr. W. L. Long, Medical Library Association Exchange, Dr. F. R. Packard, J. H. Packard, 3rd. (from the estate of C. S. W. Packard); Drs. David Riesman, P. J. Sartain; W. B. Saunders Co.; Drs. A. C. Sautter, G. E. de Schweinitz, J. E. Talley; University of Pennsylvania Library; Drs. Joseph Walsh, P. F. Williams.

Various publishing houses have presented volumes as follows:

P. Blakiston's Son & Co., 9; F. A. Davis Co., 11; Lea and Febiger, 26; J. B. Lippincott Co., 10; W. B. Saunders Co., 52.

Twenty-three volumes were presented by the following authors or editors:

L. Colebrook, C. K. Drinker, J. N. Evans, A. E. Fink, R. C. Flannagan, E. O. Geckeler, E. Holman, I. Holmgren, A. C. Klebs, L. Morenas, A. C. Morgan, A. F. Niemoeller, F. R. Packard, S. Puder, D. Riesman, E. A. Strecker, J. M. Thorington, E. S. Thorpe, W. P. Vail, O. H. Wangensteen.

Exchanges

Copies of the *Transactions & Studies* to the number of 333 were sent either as gifts or in exchange for 299 publications of other organizations.

Seventy-five distributions of books or journals (250 volumes) have been made through the Medical Library Association Exchange. The library has received eighteen such distributions.

Theses and dissertations to the number of 4,560 have been received from the following European Schools of Medicine with which we exchange publications at the present time:

Universities of Amsterdam, Basle, Batavia, Berlin, Bonn, Breslau, Cologne, Erlangen, Geneva, Giessen, Göttingen, Greifswald, Halle, Heidelberg, Jena, Kiel, Königsberg, Lausanne, Leiden, Leipzig, Louvain, Marburg, Paris, Rostock, Tartu, Tübingen, Würzburg.

Work of the Cataloguers

Number of works classified, shelf-listed, and for which cards were filed	1,136
Cards typewritten, examined, and filed	6,379
Other cards altered and filed	8,638
Pamphlets and reprints subject-headed and arranged alphabetically by subject, and by author under the subject	2,790

MISCELLANEOUS ACTIVITIES

Exhibitions. The exhibition attracting the most attention was undoubtedly that of early American medical periodicals. Wider interest in it was certainly aroused by the unexpected (to us) printing in the *Annals of Medical History* of a check-list which first appeared in our *Fugitive Leaves*. Other exhibitions were devoted to works illustrating the development of our knowledge of respiration; and to early works on plastic surgery. An appropriate, and usually extensive, exhibition was prepared for each of the meetings of the Section on Medical History. It is highly gratifying to the Library Committee and the librarian to see the interest which all of these, as well as the displays of rare books recently acquired, evoked.

Publications. The booklist was issued nine times, instead of eight, during the year, following the precedent established last year. The *Fugitive Leaves*, the first issue of which appeared in March, 1935, were brought to a close with the twenty-fourth issue, that of March, 1938. The reception accorded them, both within and outside the family circle, made it evident that there were many who welcomed the exploratory little journeys into the by-ways of the library that they offered. The decision of the Council to expand the *Transactions*, so as to include historical studies based, chiefly, on material in the library, was a result. Each of the issues of the *Transactions & Studies* has contained, and may be expected to contain in the future, such studies—less fugitive possibly, but, we hope, of more general usefulness.

Student-aid Workers. Projects undertaken by student-aid workers have included: continuation of the task of checking periodical series in the stacks against the periodicals catalogue; the taking of a careful inventory of all accessioned material; the compilation of lists of current periodicals received, to be kept available for readers on the tables in the Current-periodicals Room; classification and listing of several thousands of volumes received as bequests to the library.

Staff. The librarian read papers before five Societies; attended the annual meeting of the Medical Library Association (as a member of its Executive Committee); attended the earlier sessions of the Institute of the History of Medicine's Graduate Week; contributed, by request, an article on the library to the *Medical Times*, a bibliographic note to the *Annals of Medical History*, an article and the Census of Incunabula to the College's

Transactions & Studies; served as editor of the latter and of the preceding volume of the *Transactions.*

Miss L. Fry resigned her position as assistant cataloguer, and was succeeded in September, 1938, by Miss S. H. Todd, a graduate of Bryn Mawr.

Mrs. H. C. Wood, 3rd., was engaged as a special assistant in September, 1938.

The staff otherwise remained the same, and was comprised of the following: Miss Gertrude Bishop, cataloguer; Miss Helen Jackson, assistant-in-charge of the Reading Room; Mr. R. H. Baugh, assistant-in-charge of the Current-periodicals Room; Miss Kathryn Haegele, junior assistant and substitute at the circulation desk; Miss Marion Jackson, junior assistant and photostat operator; Miss Hertha Bishop, junior assistant in charge of book-orders.

Donors have been numerous, not the least of them being, as usual, the Friends of the Library, under the leadership of Dr. Charles W. Burr. One gift, however, because of its implications, requires special mention. It was a gift of ten dollars, sent to us with the explanation that the donors felt that the addition of one or more books to the library would serve as a more fitting remembrance of a recently dead colleague than would an addition to the multiplicity of flowers at his funeral.

W. B. McDaniel, 2d,
Librarian.

Approved:
David Riesman, M.D.,
Chairman

Report of the Committee on the Mütter Museum

The Museum was open to Fellows and guests, on days when the College building was regularly open, from 10 to 1 and 2 to 6, except Saturdays, when the hours were 9 to 1. The clerk-technician, Miss Janet Higgins, was constantly in attendance during those hours. In addition, and following a long-standing custom, the Museum was open to visitors for the hour immediately preceding the beginning of evening meetings held at the College. During these periods one of the janitorial staff was present. The clerk-technician has reported a considerable increase in the number of visitors during the past year.

Acquisitions to the permanent collection of the Museum, and thus subject to the Mütter Deed of Gift, were as follows:

Two amputating knives with ebony handles, in use about 1840. Presented by Chevalier Jackson, M.D.

Ink polygraph used by Sir James Mackenzie. Presented by James E. Talley, M.D.

Hodge obstetrical forceps, at least 80 years old, used by Dr. John Whiteside of Haddington. Presented by James E. Talley, M.D.

Dr. Joseph McFarland was re-appointed curator of the Museum for the year 1937–38, and devoted a considerable amount of time to studying and working on the collections, particularly those which had not hitherto received much attention.

J. Parsons Schaeffer, M.D.,
Chairman.

Report of the Committee on College Collections

The Committee on College Collections has continued its work with the assistance of the distinguished curator, Dr. Joseph McFarland. The work in which Miss Higgins has actively participated does not show very conspicuously, but it can be reported that the system and order has been very much improved during the year. Many things have been unearthed by the curator in the great collections of the College that will be additions to the historic interest of the entire institution, affording an important source of material for memoirs. The details that have led up to a better knowledge of the possessions of the College and our organization can be quoted somewhat as follows: A cross index of donors added to the alphabetical index files; rechecking of all medals with the card index; additional information on the cards concerning the artist, donor and size of the extensive oil painting gallery; renovation of the manuscript found in the oil painting of Hippocrates; re-placing of certain possessions, notably a removal from the dark cases in the Packard room, to safer storage places or to display.

The following portraits have been renovated, by both resurfacing and rebacking, by Mr. Justin A. Pardi: Thomas Mütter, Joseph Hartshorne, Samuel Lewis, Samuel Jackson, Joseph Leidy, William Wood Gerhard.

The Committee has labored ever since its inception for repair and renovation of the very valuable gallery. Many portraits have been brought to a state of brilliance and of safety by these activities, but many remain to be repaired in order to insure a long life. It is realized that the finances of the College do not permit a very considerable appropriation for this purpose but it is hoped that the real need for this will not be overlooked. The dignity of our gallery is appreciated by everyone but the need to maintain it is easily forgotten. If the general funds of the College cannot provide adequate yearly sums for renovation of paintings, perhaps informal requests for voluntary contributions might be made or someone of generous mind might supply an endowment. It might even be suggested that a review of our legal Counsel of his decision on the application of the Abbe Fund be asked with the hope that he could see it possible to permit the use of accumulated income for this purpose. The Committee is of the opinion that Dr. Abbe, in his Deed of Gift, did wish that the Council use its discretion in both the assembling of memorabilia and the maintenance thereof.

Herbert Fox, M.D.,
Chairman.

Reports of the Treasurer for the Years Ended November 30, 1937 and November 30, 1938

BALANCE SHEETS

Assets	*November 30, 1937*			*November 30, 1938*		
Plant						
Land at 22d & Ludlow Sts.	$46,409.75			$46,409.75		
Building at this address	364,681.41	$411,091.16		364,681.41	$411,091.16	
Other Real Estate						
Land at 13th & Locust Sts.		150,000.00			150,000.00	
Fund Investments						
Bonds (Coupon)	428,498.49			434,336.77		
Bonds (Registered Loans)	41,863.75			36,870.00		
Stocks	92,931.42			102,932.20		
Mortgages	21,500.00			21,000.00		
Real Estate (Received in Foreclosure)	31,905.92	616,699.58		31,905.92	627,044.89	
Income Invested in Bonds		3,955.00			3,955.00	
Accounts Receivable		245.54			241.28	
Cash						
Trust Funds						
Principal Account for Investment	338.54			686.45		
Income	6,356.45			7,731.12		
Administration	2,805.26	9,500.25		3,434.11	11,851.68	
Total			$1,191,491.53			$1,204,184.01
Liabilities						
Unexpended Appropriations						
Library General Account	$406.24			$766.03		
Publication Committee	150.00			500.00		
Committee on College Collections	24.93					
Contributions for Furnishing President's Room	200.00			525.00		
Contributions from the Friends of the Library			781.17	103.82		$1,894.85
			$1,190,710 36			$1,202,289.16

Plant Funds Invested in Land and Building		$561,091.16			$561,091.16	
College Funds						
Library Funds	$426,691.89			$436,741.34		
Publication Funds	15,898.73			15,898.73		
Prize and Lecture Funds	30,585.32			30,585.32		
General Operating Funds	122,645.54			123,909.31		
Entertainment Funds	12,020.62			12,020.62		
Miscellaneous Funds	9,814.29	617,656.39		9,814.29	628,969.61	
Income from Special Funds Invested		3,955.00			3,955.00	
Unexpended Income from Funds for Special Purposes		6,356.45			7,731.12	
Unexpended Current Operating Income		1,651.36			542.27	
			$1,190,710.36			$1,202,289.16

CASH STATEMENTS

	November 30, 1937		November, 30, 1938	
Income				
Balance on Hand, 12/1/36	$8,710.91			
Balance on Hand, 12/1/37			$9,500.25	
Investments Matured or Sold	32,245.75		25,709.26	
Accretions to Principal from Sale of above Securities	3,995.57		152.25	
Received on Account of Distribution of Principal.	300.00		474.61	
Income Transferred to Principal Account	100.00		50.00	
Pledges Paid to Reserve Fund	20.00		20.00	
Entrance Contribution to Reserve Fund	1,220.00		600.00	
Additional Contribution to Reserve Fund	100.00		500.00	
Contributions from Fellows	18,701.50		18,800.29	
Contributions for Use of Halls	1,205.00		1,200.00	
Contributions for Use of Lantern	284.50		258.00	
Rent from Land, 13th & Locust Sts.	6,175.00		4,987.50	
Insurance Dividends	137.50		137.50	
Interest from Western Savings Fund	106.30		79.02	
Income from Special Funds	28,832.61		27,363.44	
Contributions from Friends of the Library	570.00		400.00	
Contributions for Furnishing President's Room.	200.00		325.00	
Miscellaneous Income	1,516.44		918.42	
Contributions to Comm. on Arrangements, 150th Anniv. Celebration	3,628.55		———	
Contribution to Comm. on College Collections.	———		100.00	
Contribution to Publication Comm.	———		500.00	
Contribution to Library	———		500.00	
Totals of Income		$108,049.63		$92,575.54
Expenditures				
Securities Purchased	$36,998.62		$26,538.21	
Library Committee	22,478.89		25,862.33	
Hall Committee	10,363.98		10,624.98	
Committee on Publication	1,585.02		1,633.94	
Committee on Scientific Business	150.00		200.00	
Committee on College Collections	398.59		673.50	
Treasurer	6,002.90		9,481.90*	
Secretary	1,859.02		1,956.57	
Friends of the Library	752.75		293.83	
Committee on Finance	52.50		———	
Renovation of Portraits	247.50		———	
Taxes on Land, 13th & Locust Sts.	3,760.82		———	
From Special Funds to Library, Publication, and General Administration	11,473.50		———	
Special Comm. on Arrangements, 150th Anniv. Celebration	2,425.29			
Miscellaneous Expenditures	———		3,458.60	
Totals of Expenditures		98,549.38		80,723.86
Balance on Hand		$9,500.25		$11,851.68
Penna. Co. Principal Account		$338.54		$686.45
Penna. Co. Income Account		5,681.00		7,607.61
Girard Trust Co.		312.25		312.25
Western Savings Fund Account		3,161.02		3,240.04
Petty Cash Account		7.44		5.33
Total Cash Balance		$9,500.25		$11,851.68
Principal Account for Investment		$338.54		$686.45
Trust Fund Income		6,356.45		7,731.12
Operating Account Income		2,805.26		3,434.11
Total		$9,500.25		$11,851.68

* Including taxes on land, 13th & Locust Sts.

SUMMARIES OF OPERATING INCOME AND EXPENDITURES

	1937		1938	
Income				
Contributions from Fellows. . .	$18,701.50		$18,800.29	
Contributions for Use of Halls	1,205.00		1,200.00	
Contributions for Use of Lantern. . . .	284.50		258.00	
Land at 13th & Locust Sts.. . .	2,414.18		4,987.50	
Insurance Dividends	137.50		137.50	
Interest on Western Savings Fund Account.	106.30		79.02	
Income from Funds for General Operating Purposes.	5,252.28		4,851.06	30,313.37
Sale of Transactions.	3.27		———	
Balance on Hand.	———			1,651.36
Total. . .		$28,104.53		$31,964.73
Expenditures				
Hall Committee.	$10,148.63		$10,622.36	
Library Committee.	7,300.00		7,800.00	
Treasurer.	5,999.38		9,481.90*	
Secretary.	1,854.07		1,956.57	
Publication Committee.	550.00		813.06	
Committee on College Collections. . .	398.59		548.57	
Committee on Scientific Business.	150.00		200.00	
Finance Committee.	52.50			
Total.		26,453.17		$31,422.46
Unexpended Operating Income. . . .		$1,651.36		$542.27

* Including taxes on land, 13th & Locust Sts.

SUMMARIES OF COLLEGE TRUST FUNDS

		Principal	Investment	Balance of Income	Income	Expenditures	Balance of Income
				(1936)			(1937)
(1937)	Library Funds	$426,691.89	$426,180.11	$2,954.50	$18,215.44	$19,514.49	$1,655.45
	Publication Funds	15,898.73	15,752.06		673.46	673.46	
	Prize and Lectureship Funds	30,585.32	30,544.51	2,807.69	1,084.89	705.10	3,187.48
	General Operating Funds	122,645.54	122,493.82		5,252.28	5,252.28	
	Entertainment Funds	12,020.62	11,982.05	(1,550.90)	597.41	424.17	(1,377.66)
	Miscellaneous Funds	9,814.29	9,747.03	2,362.70	586.50	58.02	2,891.18
		$617,656.39	$616,699.58	$6,573.99	$26,409.98	$26,627.52	$6,356.45
				(1937)			(1938)
(1938)	Library Funds	$436,741.34	$436,090.17	$1,655.45	$19,060.13	$18,633.48	$2,082.10
	Publication Funds	15,898.73	15,836.34		670.88	670.88	
	Prize and Lectureship Funds	30,585.32	30,544.51	3,187.48	1,083.58	845.40	3,425.66
	General Operating Funds	123,909.31	122,844.79		6,091.80	6,091.80	
	Entertainment Funds	12,020.62	11,982.05	(1,377.66)	525.55	247.21	(1,099.32)
	Miscellaneous Funds	9,814.29	9,747.03	2,891.18	431.50		3,322.68
		$628,969.61	$627,044.89	$6,356.45	$27,863.44	$26,488.77	$7,731.12

	Principal	Investments	Balance of Income (1936)	Income	Expenditures	Balance of Income (1937)
Library Funds (1937) Baker, Henrietta R. F.	$5,412.06	$5,378.61	$37.05	$265.00	$274.51	$27.54
Bent, Luther S.	1,003.75	963.25	35.55	45.00	61.61	18.94
Binding Books, Periodicals	420.00	400.00		24.67	24.67	
Carter, William T.	5,000.00	4,966.88	13.87	157.50	158.00	13.37
Catalogue Endowment	1,030.32	1,024.35		49.50	49.50	
Clarkson, Gerardus	1,000.00	967.50	15.65	40.00	41.30	14.35
Dercum, Francis X.	5,000.00	4,993.50	93.68	204.50	256.39	41.79
Duhring, Louis A. (Book)	5,000.00	4,993.75	84.73	200.00	177.06	107.67
Duhring, Louis A. (Library)	266,329.84	266,394.88		10,763.47	10,763.47	
Eshner, Augustus A.	5,000.00	5,000.00	96.02	300.00	281.93	114.09
Friends of Library #2	361.29	360.00	9.60	9.00		18.60
Griscom, John D.	3,250.00	3,337.50	109.89	250.00	309.49	50.40
Harte, Richard H.	5,000.00	4,990.62	111.72	280.00	302.33	89.39
Hunter, Charles T.	489.73	454.19	16.72	13.00	4.32	25.40
Rare Book	475.00	451.20		19.00		19.00
Jenks, William F.	7,026.56	7,050.25	126.89	284.35	219.79	191.45
Judson, Oliver A.	1,139.91	1,096.70	21.75	49.50	42.74	28.51
Keating, Wm. V. and John M.	1,003.75	953.88	34.91	45.00	61.91	18.00
Keen, William W.	5,435.18	5,404.10	69.06	234.33	239.93	63.46
Leffman, Henry			217.82	399.06	620.78	(3.90)
Library Endowment	14,755.08	14,790.99	271.58	494.56	712.35	53.79
Longstreth, Morris	22,317.63	22,282.07		912.83	912.83	
Magee, Horace	15,146.06	15,087.80	302.78	707.01	854.80	154.99
Mears, J. Ewing	5,411.87	5,392.80	84.00	258.00	332.39	9.61
Mills, Charles K.	182.71	161.30	14.85	8.00	16.26	6.59
Mitchell, S. Weir	5,140.00	5,077.50	8.60	233.00	177.21	64.39
Montgomery, E. E.	3,057.50	3,054.00	29.55	154.00	126.64	56.91
Musser, John H.	518.59	500.00	14.17	22.50	32.62	4.05
Newcomet, Elizabeth			51.70	47.50	55.35	43.85
Norris, William F.	4,569.91	4,512.25	67.86	199.10	225.84	41.12
Oliver, Charles	1,221.66	1,178.00	58.56	53.50	32.14	79.92
Phila. Medical Society	557.50	570.25	18.12	22.50	32.25	8.37
Rodman, Lewis	5,074.64	5,080.26	144.49	198.20	305.47	37.22
Warren, Douglas Stockton	3,000.00	3,009.00	74.19	124.00	143.78	54.41
Weightman, John F.	1,072.50	1,025.50	20.59	45.00	23.32	42.27
White, J. William	5,240.91	5,210.13	264.51	252.00	661.90	(145.39)
Wistar, Caspar	5,263.53	5,242.02	68.02	201.09	193.35	75.76
Wood, George B.	9,784.41	9,843.58	190.55	379.77	541.91	28.41
Ziegler, S. Lewis	5,000.00	4,981.50	175.47	270.00	244.35	201.12
	$426,691.89	$426,180.11	$2,954.50	$18,215.44	$19,514.49	$1,655.45

Library Funds (1938)	Principal	Investments	Balance of Income (1937)	Income	Expenditures	Balance of Income (1938)
Baker, Henrietta R. F.	$5,412.06	$5,378.61	$27.54	$265.00	$245.34	$47.20
Bent, Luther S.	1,003.75	963.25	18.94	45.00	39.32	24.62
Binding Books, Periodicals	420.00	400.00		23.99	23.99	
Carter, William T.	5,000.00	4,966.88	13.37	157.50	89.89	80.98
Catalogue Endowment	1,030.32	1,024.35		40.50		40.50
Clarkson, Gerardus	1,000.00	967.50	14.35	25.00	11.82	27.53
Dercum, Francis X.	5,000.00	4,993.50	41.79	174.50	143.85	72.44
Duhring, Louis A. (Book)	5,006.25	4,998.81	107.67	305.00	275.73	136.94
Duhring, Louis A. (Library)	265,168.24	264,971.38		11,797.05	11,797.05	
Eshner, Augustus A.	5,000.00	5,000.00	114.09	300.00	345.79	68.30
Friends of Library #2	361.29	360.00	18.60	4.50		23.10
Griscom, John D.	3,250.00	3,337.50	50.40	250.00	268.88	31.52
Harte, Richard H.	5,000.00	5,012.52	89.39	388.90	308.73	169.56
Hunter, Charles T.	489.73	454.19	25.40	3.00	24.97	3.43
Rare Book	475.00	451.20	19.00	19.00		38.00
Jenks, William F.	7,026.56	7,050.25	191.45	263.86	467.18	(11.87)
Judson, Oliver A.	1,139.91	1,138.84	28.51	49.70	67.68	10.53
Keating, Wm. V. and John M.	1,003.75	953.88	18.00	45.00	47.90	15.10
Keen, William W.	5,435.18	5,404.10	63.46	219.32	216.57	66.21
Leffman, Henry			(3.90)	430.58	226.90	199.78
Library Endowment	14,755.08	14,790.99	53.79	342.96	277.80	118.95
Longstreth, Morris	22,317.63	22,282.07		848.32	848.32	
Magee, Horace	15,146.06	15,129.94	154.99	612.35	737.45	29.89
Mears, J. Ewing	5,411.87	5,392.80	9.61	258.00	262.42	5.19
Mills, Charles K.	182.71	161.30	6.59	5.00	9.76	1.83
Mitchell, S. Weir	5,140.00	5,119.64	64.39	234.70	254.99	44.10
Montgomery, E. E.	3,057.50	3,054.00	56.91	154.00	118.95	91.96
Musser, John H.	518.59	500.00	4.05	22.50	13.17	13.38
Newcomet, Elizabeth			43.85	25.04	43.84	25.05
Norris, William F.	4,569.91	4,554.39	41.12	199.32	208.15	32.29
Oliver, Charles	1,221.66	1,178.00	79.92	51.00	61.44	69.48
Phila. Medical Society	557.50	570.25	8.37	27.00	19.45	15.92
Rodman, Lewis	5,074.64	5,080.26	37.22	180.18	177.25	40.15
Vinton, Charles H.	11,154.80	11,095.90		265.60	156.75	108.85
Warren, Douglas Stockton	3,000.00	3,009.00	54.41	124.00	108.12	70.29
Weightman, John F.	1,072.50	1,067.64	42.27	49.20	16.56	74.91
White, J. William	5,240.91	5,210.13	(145.39)	251.00		105.61
Wistar, Caspar	5,263.53	5,242.02	75.76	198.06	216.35	57.47
Wood, George B.	9,834.41	9,843.58	28.41	404.50	264.53	168.38
Ziegler, S. Lewis	5,000.00	4,981.50	201.12		196.00	5.03
	$436,741.34	$436,090.17	$1,655.45	$19,060.13	$18,633.38	$2,082.10

	Principal	Investments	Balance of Income	Income	Expenditures	Balance of Income
Publication Funds						
(*1937*) Da Costa, J. M.	$4,766.05	$4,801.84		$191.76	$191.76	
Davis, G. G.	491.87	491.87		22.50	22.50	
General Publication	2,067.54	2,068.84		93.20	93.20	
Lister International Medical Congress	2,009.78	1,976.75		61.72	61.72	
Meigs, Arthur V.	1,034.50	1,000.00		50.00	50.00	
Tyson, James	528.99	498.50		22.50	22.50	
Wyeth, Francis Houston	5,000.00	4,998.54		229.20	229.20	
	$15,898.73	$15,836.34		$670.88	$670.88	
(*1938*) Da Costa, J. M.	$4,766.05	$4,801.84		$194.76	$194.76	
Davis, G. G.	491.87	491.87		22.50	22.50	
General Publication	2,067.54	2,026.70		93.00	93.00	
Lister International Medical Congress	2,009.78	1,976.75		61.70	61.70	
Meigs, Arthur V.	1,034.50	1,000.00		50.00	50.00	
Tyson, James	528.99	498.50		22.50	22.50	
Wyeth, Francis Houston	5,000.00	4,956.40		229.00	229.00	
	$15,898.73	$15,752.06		$673.46	$673.46	
Prize and Lectureship Funds			(1936)			(1937)
(*1937*) Alvarenga Prize	$9,574.33	$9,536.96	$738.77	$306.89	$2.00	$1,043.66
Anders, James M., Lectureship Fund	6,010.99	6,007.55	689.59	288.00	216.10	761.49
Newbold, Mary Scott, Lectureship Fund	15,000.00	15,000.00	1,379.33	490.00	487.00	1,382.33
	$30,585.32	$30,544.51	$2,807.69	$1,084.89	$705.10	$3,187.48
			(1937)			(1938)
(*1938*) Alvarenga Prize	$9,574.33	$9,536.96	$1,043.66	$305.58	$300.00	$1,049.24
Anders, James M., Lectureship Fund	6,010.99	6,007.55	761.49	288.00	165.30	884.19
Newbold, Mary Scott, Lectureship Fund	15,000.00	15,000.00	1,382.33	490.00	380.10	1,492.23
	$30,585.32	$30,544.51	$3,187.48	$1,083.58	$845.40	$3,425.66

	Principal	Investments	Balance of Income	Income	Expenditures	Balance of Income
General Operating Funds						
(*1937*) College Endowment	$11,519.72	$11,491.50		$612.40	$612.40	
Reserve	50,947.93	49,910.33		1,905.13	1,905.13	
Shippen, Elizabeth	5,000.00	4,999.00		250.00	250.00	
Weightman, William	55,177.89	56,092.99		2,484.75	2,484.75	
	$122,645.54	$122,493.82		$5,252.28	$5,252.28	
(*1938*) College Endowment	$11,610.68	$11,612.50		$504.95	$504.95	
Reserve	52,189.32	51,105.00		2,214.10	2,214.10	
Shippen, Elizabeth	5,000.00	4,999.00		254.50	254.50	
Weightman, William	55,109.31	55,128.29		3,118.25	3,118.25	
	$123,909.31	$122,844.79		$6,091.80	$6,091.80	
Entertainment Funds			(*1936*)			(*1937*)
(*1937*) Harte, Richard H.	$4,690.57	$4,666.01	$(2,129.12)	$439.97	$424.17	$(2,113.32)
Mitchell, S. Weir	7,330.05	7,316.04	578.22	157.44		735.66
	$12,020.62	$11,982.05	$(1,550.90)	$597.41	$424.17	$(1,377.66)
			(*1937*)			(*1938*)
(*1938*) Harte, Richard H.	$4,690.57	$4,666.01	$(2,113.32)	$387.63	$247.21	$(1,972.90)
Mitchell, S. Weir	7,330.05	7,316.04	735.66	137.92		873.58
	$12,020.62	$11,982.05	$(1,377.66)	$525.55	$247.21	$(1,099.32)
Miscellaneous Funds			(*1936*)			(*1937*)
(*1937*) Abbe, Robert	$5,740.19	$5,737.09	$1,094.80	$379.50		$1,474.30
Gross, Samuel D.	2,910.00	2,859.75	533.15	155.00	$58.02	630.13
Wood, Horatio C.	1,164.10	1,150.19	734.75	52.00		786.75
	$9,814.29	$9,747.03	$2,362.70	$586.50	$58.02	$2,891.18
			(*1937*)			(*1938*)
(*1938*) Abbe, Robert	$5,740.19	$5,737.09	$1,474.30	$379.50		$1,853.80
Gross, Samuel D.	2,910.00	2,859.75	630.13			630.13
Wood, Horatio C.	1,164.10	1,150.19	786.75	52.00		838.75
	$9,814.29	$9,747.03	$2,891.18	$431.50		$3,322.68

T. Grier Miller,
Treasurer.

Presidents of the College

Elected	
1787	JOHN REDMAN
1805	WILLIAM SHIPPEN
1809	ADAM KUHN
1818	THOMAS PARKE
1835	THOMAS C. JAMES*
1835	THOMAS T. HEWSON
1848	GEORGE B. WOOD
1879	W. S. W. RUSCHENBERGER
1883	ALFRED STILLÉ
1884	SAMUEL LEWIS†
1884	J. M. DA COSTA
1886	S. WEIR MITCHELL
1889	D. HAYES AGNEW
1892	S. WEIR MITCHELL
1895	J. M. DA COSTA
1898	JOHN ASHHURST, JR.
1900	W. W. KEEN
1902	HORATIO C. WOOD
1904	ARTHUR V. MEIGS
1907	JAMES TYSON
1910	GEORGE E. DE SCHWEINITZ
1913	JAMES CORNELIUS WILSON
1916	RICHARD H. HARTE
1919	WILLIAM J. TAYLOR
1922	THOMAS R. NEILSON
1925	HOBART A. HARE
1928	JOHN H. GIBBON
1931	FRANCIS R. PACKARD
1934	ALFRED STENGEL
1937	GEORGE P. MULLER

* Died four months after his election.

† Resigned on account of ill-health.

Officers and Committees, 1938

President

George P. Muller

Vice-President

Edward B. Krumbhaar

Censors

George E. de Schweinitz*
John H. Gibbon
Thomas R. Neilson
Francis R. Packard

Secretary

J. Harold Austin

Treasurer

T. Grier Miller

Honorary Librarian

Albert P. Brubaker

Elective Councillors

To serve until January, 1939
Richard A. Kern
Alexander Randall

To serve until January, 1940
Francis Heed Adler
William R. Nicholson

To serve until 1941
E. J. G. Beardsley
John B. Flick

Ex-presidential Councillor
Alfred Stengel

Council

The foregoing officers and the chairmen of the nine standing committees.

STANDING COMMITTEES

Publication

Thomas Fitz-Hugh, Jr., *Ch'n*
Russell S. Boles
Henry K. Mohler

* Died August 22, 1938.

Library

David Riesman, *Ch'n*
George W. Outerbridge
Wm. Egbert Robertson
Edward A. Schumann
Philip F. Williams
The Honorary Librarian (*ex officio*)

Hall

George M. Laws, *Ch'n*
Harry L. Bockus
Ralph S. Bromer
Robert H. Ivy
Hubley R. Owen

Mütter Museum

J. Parsons Schaeffer, *Ch'n*
Herbert Fox
Stanley P. Reimann

College Collections

Herbert Fox, *Ch'n*
Stanley P. Reimann
J. Parsons Schaeffer

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Frederick Fraley
Joseph Stokes, Jr.
The President and the Treasurer (*ex officio*)

Scientific Business

Edward L. Bortz, *Ch'n*
Charles Leonard Brown
Eugene M. Landis
The President and the Secretary (*ex officio*)

Public Health, Preventive Medicine and Public Relations

Hobart A. Reimann, *Ch'n*
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Maurice S. Jacobs
Samuel Bradbury
Harold F. Robertson
The President (*ex officio*)

Entertainments

Charles W. Burr, *Ch'n*
Gilson G. Engel
Edward Rose
The President (*ex officio*)

PRIZE COMMITTEES AND TRUSTEES

Nathan Lewis Hatfield Prize and Lectureship

(Until February, 1940)

Ralph Pemberton, *Ch'n*
Charles C. Norris
Ralph M. Tyson

Alvarenga Prize

Baulduin H. E. Lucké, *Ch'n*
Henry C. Bazett
Garfield G. Duncan
I. S. Ravdin
Lawrence W. Smith

Mary Scott Newbold Lectures

(Until January, 1939)

Robert G. Torrey, *Ch'n*
Harold W. Jones
Grayson P. McCouch
The President and the Chairman of the Committee on Scientific Business (*ex officio*)

Weir Mitchell Oration

(Until February, 1939)

Francis W. Sinkler, *Ch'n*
Henry P. Brown, Jr.
David L. Farley
R. Tait McKenzie*
Edward A. Strecker

Trustees of Nathan Lewis Hatfield Prize and Lectureship

William D. Stroud
R. N. Downs, Jr.
J. Montgomery Deaver

Trustee Under the Will of Thomas Skelton Harrison

(Until February, 1941)

Charles J. Hatfield

OFFICERS OF THE SECTIONS

General Medicine

Chairman, Edward Rose
Clerk, J. Alexander Clarke
Executive Committee, Henry K. Mohler, Richard A. Kern, Harold W. Jones

Medical History

Chairman, R. Tait McKenzie†
Clerk, Louis B. Laplace
Executive Committee, Edward B. Krumbhaar, David Riesman, Francis R. Packard

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Otolaryngology

Chairman, Curtis C. Eves
Clerk, William Hewson
Executive Committee, Ralph Butler, Benjamin D. Parish, Walter Roberts

* Died April 28, 1938.
† Died April 28, 1938, and was succeeded as chairman by Burton Chance.

PUBLIC HEALTH, PREVENTIVE AND INDUSTRIAL MEDICINE

Chairman, ALEX. H. DAVISSON
Clerk, MAURICE S. JACOBS
Executive Committee, WALTER S. CORNELL, RANDLE C. ROSENBERGER, JOSEPH STOKES, JR.

Staff of the College

Librarian, Editor, and Superintendent

W. B. McDANIEL, 2D

Curator of the Mütter Museum

JOSEPH McFARLAND

Clerk, OLGA LANG
Assistant Clerk, HELEN M. NASH

Assistant Superintendent, ROBERT G. MUIR

Fellows

December 31, 1938

For degrees and titles, when not listed, see earlier editions of the Transactions as follows:

* 1932, 3s. LIV.
[1] 1933, 4s. I, No. 1.
[2] 1934, 4s. II, No. 3.
[3] 1935, 4s. III, No. 2.
[4] 1936, 4s. IV, No. 2.
[5] 1937, 4s. V.

ELECTED

1934. Abbott, William Osler, 133 S. 36th St., Phila.[5]
1912. Addison, William H. F., Medical Laboratories, Univ. of Pa., Phila.*
1926. Adler, Francis Heed, 313 S. 17th St., Phila.[5]
1914. Aiken, Thomas G., m.d., Otolaryngologist, Chester County Hospital and Pennsylvania Epileptic Hospital. Berwyn, Pa.
1936. Aldridge, Fred Cutler, Wayne, Pa.[3]
1936. Alexander, Fay Knight, 8835 Germantown Ave., Phila.[3]
1906. Allen, Francis Olcott, Jr., 2216 Walnut St., Phila.*
1932. Allen, Frederick H., 1711 Fitzwater St., Phila.*
1896. Allyn, Herman Bryden, a.b., m.d., Consulting Physician, Woman's Hospital and Philadelphia General Hospital. 3910 Chestnut St., Phila.
1935. Alpers, Bernard J., m.d., scd.(med.), Professor of Neurology, Jefferson Medical College; Neurologist, Jefferson, Pennsylvania and Philadelphia General Hospitals. 111 North 49th St., Phila.
1933. Alston, Robert S., 121 Walnut Lane, Phila.[1]
1905. Anspach, Brooke M., 1827 Spruce St., Phila.*
1930. Appel, Kenneth E., 408 Berkley Rd., Haverford, Pa.*
1905. Appleman, Leighton Francis, m.d., Attending Surgeon, Wills Hospital; Assoc. Professor of Ophthalmology, Graduate School of Medi cine, Univ. of Pa.; Consulting Ophthalmologist, Frederick Douglass Memorial Hospital. 308 S. 16th St., Phila.
1935. Armitage, George L., 400 E. 13th St., Chester, Pa.[3]
1922. Arnett, John H., 2116 Pine St., Phila.*
1920. Astley, G. Mason, 812 N. 63d St., Phila.*
1935. Atlee, John L., m.d., 37 E. Orange St., Lancaster, Pa.
1935. Atlee, John L., Jr., a.b., m.d., 37 E. Orange St., Lancaster, Pa.
1914. Austin, J. Harold, 821 Maloney Clinic, Univ. of Pa., Phila.*

1906. Babbitt, James A., 1912 Spruce St., Phila.*
1935. Bach, Theodore F., 1900 Rittenhouse Sq., Phila.[3]
1937. Bacon, Emily P., a.b., m.d., scd., Professor of Pediatrics, Woman's Medical College; Visiting Pediatrician, The Woman's Hospital; Visiting Pediatrician, Mary J. Drexel Children's Hospital; Board Member of The Babies Hospital. 2104 Spruce St., Phila.
1916. Balentine, Percy L., 407 Weightman Bldg., 1524 Chestnut St., Phila.*
1898. Balliet, Tilghman M., 3920 Sansom St., Phila.*
1934. Bank, Joseph, 737 W. Moreland St., Phoenix, Ariz.[2]
1911. Barnard, Everett P., 1820 S. Rittenhouse Sq., Phila.*
1924. Bartle, Henry J., 1930 Chestnut St., Phila.*
1931. Bates, William, b.s., m.d., Professor of Surgery, Graduate School of Medicine, Univ. of Pa.; Surgeon, Graduate, Presbyterian and Wills Hospitals. 2029 Pine St., Phila.
1932. Batson, Oscar V., 3502 Hamilton St., Phila.*
1921. Bauer, Edward L., 345 S. 19th St., Phila.[5]
1933. Bauer, John T., Pennsylvania Hospital, Phila.[1]
1922. Bazett, Henry C., Haverford, Pa.*
1938. Beach, Edward Warren, m.d., Asst. Professor of Anesthesia, Graduate School of Medicine, Univ. of Pa.; Chief of Dept. of Anesthesia, Graduate and Wills Eye Hospitals. 4400 Walnut St., Phila.
1908. Beardsley, E. J. G., 1919 Spruce St., Phila.*
1930. Beardwood, Joseph T., Jr., 2031 Locust St., Phila.[2]
1935. Beerman, Herman, Chatham Court Apts., 49th and Locust Sts., Phila.[5]
1932. Behney, Charles A., 133 S. 36th St., Phila.*
1934. Behrend, Moses, 1738 Pine St., Phila.[2]
1930. Belk, William Parks, a.b., m.d., Director Laboratory Protestant Episcopal Hospital; Instructor Clinical Biochemistry, Graduate School of Medicine, Associate, Pepper Laboratory, School of Medicine, Univ. of Pa.; Consulting Pathologist Fitkin Memorial, Monmouth Memorial and Bryn Mawr Hospitals. Ardmore, Pa.
1936. Bell, Benjamin Tertius, m.d., Visiting Surgeon in Orthopaedics, Abington Memorial Hospital; Orthopaedic Surgeon, The Home of The Merciful Saviour for Crippled Children; Asst. Orthopaedic Surgeon, Orthopaedic Hospital; Asst. Orthopaedic Surgeon, Bryn Mawr Hospital. 1930 Chestnut St., Phila.
1937. Bertolet, J. Allan, 329 S. 18th St., Phila.[5]
1934. Biddle, Sydney Geoffrey, Medical Towers Bldg., 17th and Latimer Sts., Phila.[2]
1918. Billings, Arthur E., 2020 Spruce St., Phila.*
1917. Birdsall, Joseph C., 4610 Spruce St., Phila.*
1933. Bishop, Paul A., m.d., Director, Dept. Radiology, Pennsylvania Hospital; Director, Dept. Roentgenology, Delaware Co. Hospital; Asso-

ciate in Radiology, Graduate School of Medicine, Univ. of Pa. Pennsylvania Hospital, Phila.

1908. Bland, P. Brooke, 1621 Spruce St., Phila.*

1917. Block, Frank B., 1017 Medical Arts Bldg., Phila.*

1929. Bockus, Harry L., 250 S. 18th St., Phila.*

1928. Boles, Russell S., m.d., Visiting Physician, Philadelphia General Hospital; Associate in Medicine, Univ. of Pa.; Consulting Gastroenterologist, U. S. Veterans' Bureau, Phila.; Chief in Gastroenterology, Bryn Mawr Hospital. Rittenhouse Plaza, Phila.

1923. Bond, Earl D., 707 Old Lancaster Road, Bryn Mawr, Pa.*

1911. Bonney, Charles W., 1117 Spruce St., Phila.*

1924. Boon, David J., 1532 N. 15th St., Phila.*

1931. Bortz, Edward Le Roy, a.b., m.d., Assoc. Professor of Medicine, Graduate School of Medicine, Univ. of Pa.; Chief of Medical Service B, Lankenau Hospital. 2021 W. Girard Ave., Phila.

1921. Borzell, Francis Frank, m.d., Radiologist, Frankford Hospital; Radiologist, Burlington Co. Hospital, Mt. Holly, N. J.; Radiologist, Friends Hospital; Asst. Professor of Radiology, Graduate School of Medicine, Univ. of Pa. 4940 Penn St., Frankford, Phila.

1936. Bostwick, Delazon Swift, m.d., Instructor in Otolaryngology, School of Medicine, Univ. of Pa.; Instructor in Otology, Graduate School of Medicine, Univ. of Pa.; Asst. Otolaryngologist, Methodist Episcopal Hospital. 106 Linwood Ave., Ardmore, Pa.

1928. Bothe, Albert E., 133 S. 36th St., Phila.*

1928. Bothe, Frederick A., 133 S. 36th St., Phila.*

1919. Bowen, David R., 1620 23rd Ave., N., St. Petersburg, Fla.*

1923. Bower, John O., m.d., Surgeon, Philadelphia General Hospital, St. Luke's and Children's Hospital, and Northeastern Hospital. Clinical Professor of Surgical Research, School of Medicine, Temple Univ. 2008 Walnut St., Phila.

1891. Boyd, George M., 1909 Spruce St., Phila.*

1907. Boyer, Henry P., 4602 Baltimore Ave., Phila.*

1925. Boykin, Irvine M., 922 Medical Arts Bldg., Phila.*

1937. Braceland, Francis J., 111 N. 49th St., Phila.[5]

1929. Bradbury, Samuel, 151 W. Coulter St., Germantown, Phila.[5]

1907. Bradley, William Nathaniel, ph.g., m.d., Professor of Pediatrics, Graduate School of Medicine, Univ. of Pa.; Pediatrist, Philadelphia General and Wills Hospitals. 1725 Pine St., Phila.

1921. Bransfield, John W., 2101 Spruce St., Phila.*

1903. Branson, Thomas F., Rosemont, Pa.*

1917. Bromer, Ralph S., 629 Pembroke Road, Bryn Mawr, Pa.*

1936. Brown, Charles L., 325 N. Bowman Ave., Merion, Pa.

1932. Brown, Claude P., 1930 Chestnut St., Phila.*

1919. Brown, Henry P., Jr., b.s., m.d., Associate in Surgery, School of Medicine, Univ. of Pa.; Asst. Professor of Surgery, Graduate School of Medicine, Univ. of Pa.; Surgeon Presbyterian, Children's and Pennsylvania Hospitals. 1930 Chestnut St., Phila.

1916. Brown, Samuel H., 1930 Chestnut St., Phila.*

1887. Brubaker, Albert P., 109 N. 34th St., Phila.*

1935. Buchanan, Mary, 1737 Chestnut St., Phila.[3]

1930. Bucher, Carl Joseph, b.s., m.d., Asst. Director, Clinical Laboratory, Jefferson Medical College Hospital. 271 S. 15th St., Phila.

1916. Buckley, Albert Coulson, m.d., Medical Superintendent, Friends Hospital; Professor of Psychiatry, Graduate School of Medicine, and Professor of Clinical Psychiatry, School of Medicine, Univ. of Pa.; Neurologist, Frankford Hospital; Honorary Consultant, Psychopathic Department, Philadelphia General Hospital. Friends Hospital, Frankford, Phila.

1935. Burden, J. Nelson, m.d., 4725 Osage Ave., Phila.

1928. Burden, Verne G., 255 S. 17th St., Phila.*

1906. Burns, Stillwell C., 1238 Atwood Rd., Phila.*

1892. Burr, Charles W., 1527 Pine St., Phila.[2]

1906. Butler, Ralph, m.d., Vice-Dean of Otolaryngology and Professor of Laryngology, Graduate School of Medicine, Univ. of Pa.; Laryngologist and Aurist, Lankenau Hospital and Mary J. Drexel Home; Member of Consulting Staff, Woman's Hospital. 1930 Chestnut St., Phila.

1934. Buzby, B. Franklin, 414 Cooper St., Camden, N. J.[2]

1907. Cadwalader, Williams B., m.d., Professor of Clinical Neurology, School of Medicine, Univ. of Pa.; Consulting Neurologist Presbyterian and Bryn Mawr Hospitals. 133 S. 36th St., Phila.

1936. Camero, Anthony Roland, 4107 Chester Ave., Phila.[3]

1928. Campbell, Edward Hastings, m.d., Assoc. Professor of Otolaryngology, Graduate School of Medicine and Asst. Professor of Otolaryngology, School of Medicine, Univ. of Pa.; Chief Otolaryngologist, Pennsylvania and Children's Hospitals; Asst. Otolaryngologist, Lankenau Hospital. 1904 Spruce St., Phila.

1931. Cantarow, Abraham, 2033 Delancey St., Phila.[5]

1935. Carey, Lawrence S., m.d., Physician and Chief of Clinic, Pennsylvania Hospital; Physician, Delaware Co. Hospital; Demonstrator in Medicine, Jefferson Medical College. 1930 Chestnut St., Phila.

1931. Cariss, Walter L., 2043 Walnut St., Phila.*

1930. Carpenter, Chapin, 1930 Chestnut St., Phila.[5]

1905. Carpenter, Herbert B., 1805 Spruce St., Phila.*

1926. Carpenter, Howard Childs, 1805 Spruce St., Phila.*

1895. Carpenter, John T., 1930 Chestnut St., Phila.*

1917. Carson, John B., b.s., m.d., Visiting Physician, Episcopal Hospital, Phila. 1802 Pine St., Phila.

1922. Case, Eugene A., m.d., Professor of Morbid Anatomy, Graduate School of Medicine, Univ. of Pa.; Director of the Laboratories, Graduate Hospital; Asst. Pathologist, Philadelphia General Hospital. 63 W. La Crosse Ave., Lansdowne, Pa.

1937. Castallo, Mario A., a.b., m.d., Demonstrator of Obstetrics, Jefferson Medical College; Chief of Clinic Venereal Diseases Complicating Pregnancy and Clinical Assistant in Obstetrics, Jefferson Medical College Hospital; Asst. Obstetrician, St. Joseph's Hospital. 2126 Spruce St., Phila.

1933. Chamberlain, W. Edward, Temple University Hospital, Phila.[1]

1900. Chance, Burton, 317 S. 15th St., Phila.*

1903. Chrystie, Walter, Bryn Mawr, Pa.*

1929. Clark, Eliot R., 315 S. 41st St., Phila.*

1934. Clark, Jefferson Hamer, 3701 N. Broad St., Phila.[2]

1926. Clarke, J. Alexander, a.b., m.d., Chief Clinical Assistant, Out-Patient Department of Applied Immunology, Jefferson Hospital; Associate in Medicine, Jefferson Medical College; Chief of Service in Allergy, Dept. of Medicine, Germantown Hospital. 334 S. 21st St., Phila.

1926. Clerf, Louis H., m.d., l.l.d., Professor of Laryngology and Bronchoscopy, Jefferson Medical College; Attending Bronchoscopist, Jefferson Hospital; Bronchoscopist, Pennsylvania, Germantown, Jewish, St. Joseph's and St. Mary's Hospitals; Laryngologist to the Radiologic Clinic, Philadelphia General Hospital; Consulting Bronchoscopist, Rush Hospital and Delaware Co. Hospital. 1530 Locust St., Phila.

1910. Cloud, J. Howard, 11 W. Montgomery Ave., Ardmore, Pa.*

1903. Coates, George Morrison, 1721 Pine St., Phila.[2]

1908. Codman, Charles A. E., S.E. Corner 42d and Spruce Sts., Phila.*

1907. Cohen, Myer Solis, a.b., m.d., Asst. Professor of Medicine, Graduate School of Medicine, Univ. of Pa.; Lecturer on Medical Jurisprudence, Woman's Medical College of Pennsylvania; Pediatrist, Jewish Hospital. 2110 Spruce St., Phila.

1888. Cohen, S. Solis-, 1906 Walnut St., Phila.*

1920. Cole, Charles J., Elkins Park, Pa.*

1934. Colgan, Robert C., 5734 N. 5th St., Phila.[2]

1934. Collins, Leon Howard, Jr., a.b., m.d., Associate in Medicine, School of Medicine, Univ. of Pa.; Instructor in Medicine, School of Dentistry, Univ. of Pa.; Asst. Ward Physician, Hospital of the Univ. of Pa. 133 S. 36th St., Phila.

1930. Cooper, David A., 1520 Spruce St., Phila.*

1911. Cornell, Walter S., Board of Public Education, Parkway and 21st St., Phila.*

1914. Corson, Edward F., 1201 Medical Arts Bldg., Phila.[3]
1930. Cottrell, James E., 2031 Locust St., Phila.*
1924. Cowan, Alfred, 1930 Chestnut St., Phila.*
1904. Craig, Frank A., The Henry Phipps Institute, 7th and Lombard Sts., Phila.[5]
1907. Crampton, George S., 2031 Locust St., Phila.*
1937. Crane, Martin P., 2433 Germantown Ave., Phila.[4]
1924. Crawford, Baxter L., m.d., Director Clinical Laboratories, Jefferson Hospital; Asst. Professor of Pathology, Jefferson Medical College. Jefferson Hospital, 10th and Sansom Sts., Phila.
1920. Creighton, William J., N.E. Cor. 20th and Chestnut Sts., Phila.*
1920. Cross, George H., Chester, Pa.*
1917. Cross, Sumner H., P. O. Box 126, Jenkintown, Pa.*
1921. Crossan, Edward T., 5324 Wayne Ave., Phila.*
1904. Cruice, John M., 406 S. 22d St., Phila.*
1937. Crump, Jean, 1930 Chestnut St., Phila.[5]
1937. Curtis, Lawrence, 255 S. 17th St., Phila.[5]
1934. Custer, R. Philip, 4400 Spruce St., Phila.[2]
1938. Dannenberg, Arthur M., m.d., Attending Pediatrist, Jewish Hospital; Chief of Pre-School-Age Clinic, Phipps Institute; Instructor in Pediatrics, Graduate School of Medicine, Univ. of Pa. 235 S. 15th St., Phila.
1919. Davies, John R., Jr., 2 E. Chestnut Ave., Chestnut Hill, Phila.*
1896. Davis, Charles N., 1931 Spruce St., Phila.*
1936. Davis, David M., 225 S. 17th St., Phila.[4]
1937. Davis, Perk Lee, Suite 1305, Medical Towers, 255 S. 17th St., Phila.[5]
1916. Davis, Warren B., 135 S. 18th St., Phila.*
1900. Davisson, Alexander H., 319 S. 18th St., Phila.[5]
1935. Deaver, J. Montgomery, 1830 Delancey Pl., Phila.[5]
1902. Dehoney, Howard, 240 S. 13th St., Phila.*
1935. Deibert, Irvin Elmer, 618 Benson St., Camden, N. J.[3]
1924. Deichler, L. Waller, 1930 Chestnut St., Phila.*
1923. De Long, Perce, N.E. Cor. 20th and Chestnut Sts., Phila.*
1928. Dewees, A. Lovett, Times Medical Bldg., Ardmore, Pa.*
1924. Dillon, Edward S., a.b., m.d., Chief, Metabolic Division, Philadelphia General Hospital; Associate Physician, Pennsylvania Hospital; Asst. Professor of Diseases of Metabolism, Graduate School of Medicine, Univ. of Pa.; Asst. Medical Director, Penn Mutual Life Insurance Co. 2016 DeLancey St., Phila.
1932. Dintenfass, Henry, 1305 Spruce St., Phila.*
1920. Diven, John, 326 S. 19th St., Phila.*
1920. Doane, Joseph C., 19th and Spruce Sts., Phila.*
1933. Donnelly, Joseph C., 2008 Walnut St., Phila.[1]
1937. Donnelly, Robert T. M., 255 S. 17th St., Phila.[5]

1907. Dorrance, George M., 2101 Spruce St., Phila.*
1902. Downs, Robert N., Jr., 5916 Greene St., Phila.*
1933. Downs, T. McKean, Mt. Pleasant Road, Bryn Mawr, Pa.*
1910. Drayton, William, Jr., 407 S. 22d St., Phila.[5]
1935. Duane, William, Jr., 2100 Walnut St., Phila.[5]
1935. Duncan, Garfield G., m.d., c.m. (McGill), Asst. Professor of Medicine, Jefferson Medical College; Chief of Medical Service B, Pennsylvania Hospital; Chief Clinical Assistant, Diabetic Clinic, Jefferson Hospital. 1930 Chestnut St., Phila.
1937. Dunn, Charles W., 269 S. 19th St., Phila.[4]
1935. Eads, John T., 2029 Delancey St., Phila.[5]
1911. Earnshaw, Henry C., Bryn Mawr, Pa.*
1936. Easby, Mary Hoskins, 2123 Locust St., Phila.[4]
1937. Edeiken, Joseph, 1832 Spruce St., Phila.[4]
1930. Eiman, John, Cynwyd, Pa.*
1911. Eliason, Eldridge, L., 326 S. 19th St., Phila.*
1928. Ellison, Richard T., 1614 Locust St., Phila.*
1936. Ellson, J. Vernon, 255 S. 17th St., Phila.[5]
1904. Elmer, Walter G., 1801 Pine St., Phila.[5]
1937. Elsom, Kendall A., 133 S. 36th St., Phila.[5]
1934. Ely, William C., 3912 Chestnut St., Phila.[2]
1932. Engel, Gilson G., 1914 Pine St., Phila.*
1934. Englerth, Louis D., 5030 Oxford Ave., Frankford, Phila.[2]
1893. Eshner, Augustus A., 1019 Spruce St., Phila.*
1905. Evans, William, 500 W. Gay St., West Chester, Pa.*
1912. Eves, Curtis C., 1910 Spruce St., Phila.*
1922. Farley, David L., 1725 Pine St., Phila.*
1903. Farr, Clifford B., a.m., m.d., Psychiatrist, Institute of the Pennsylvania Hospital. Bryn Mawr, Pa.
1893. Farr, William W., 121 Maplewood Ave., Germantown, Phila.*
1930. Farrell, John T., Jr., b.s., m.d., Asst. Professor of Roentgenology, Jefferson Medical College; Roentgenologist, White Haven Sanatorium. 255 S. 17th St., Phila.
1935. Ferguson, L. Kraeer, 133 S. 36th St., Phila.[3]
1936. Fetter, Ferdinand, 322 S. 21st St., Phila.[5]
1935. Fetter, Theodore R., m.d., Associate in Genito-Urinary Surgery, Jefferson Medical College; Chief of Clinic, Dept. Genito-Urinary Surgery, Jefferson Medical College Hospital; Asst. Surgeon, Dept. Urology, Philadelphia General Hospital. 255 S. 17th St., Phila.
1924. Fewell, Alexander G., a.b., m.d., Assoc. Professor of Ophthalmology, School of Medicine and Graduate School of Medicine, Univ. of Pa.; Ophthalmologist and Chief to the Pennsylvania Hospital and the Children's Hosp. 1924 Pine St., Phila.
1884. Fisher, Henry M., Jenkintown, Pa.*

1928. Fitz-Hugh, Thomas, Jr., 2016 Delancey St., Phila.[5]
1928. Flick, John B., m.d., Clinical Professor of Surgery, Jefferson Medical College; Chief, Surgical Service A, Pennsylvania Hospital; Attending Surgeon, Bryn Mawr Hospital. 1608 Spruce St., Phila.
1908. Foulkrod, Collin, 3910 Chestnut St., Phila.*
1933. Fowler, Kenneth, 51 N. 39th St., Phila.[1]
1908. Fox, Herbert, m.d., Director, William Pepper Laboratory of Clinical Medicine, and Professor of Comparative Pathology, Schools of Medicine and Veterinary Medicine, Univ. of Pa. Hamilton Court, 39th and Chestnut Sts., Phila.
1906. Fraley, Frederick, 71st and City Line, Overbrook, Pa.*
1935. Fridy, Cyrus Ward, 58th St. and Thomas Ave., Phila.[4]
1933. Fritch, James Scott, 269 S. 19th St., Phila.[1]
1937. Fritz, Herbert H., Pennswood Rd. and Radnor St., Bryn Mawr, Pa.[4]
1935. Fry, Wilfred Eyles, 1819 Chestnut St., Phila.[3]
1937. Furlong, Thomas F., Jr., Times Medical Bldg., Ardmore, Pa.[5]
1933. Gamble, Clarence J., 103 Canton Ave., Boston, Mass.[5]
1899. Gamble, Robert G., Haverford, Pa.*
1935. Gammon, George Davis, 2124 Spruce St., Phila.[3]
1931. Garner, Vaughn C., Germantown Professional Building, Phila.*
1935. Geist, Donald C., 1930 Chestnut St., Phila.[3]
1917. Gerhard, Arthur H., 1615 N. Delaware Ave., Phila.*
1899. Gibbon, John H., 1608 Spruce St., Phila.*
1934. Gibbon, John H., Jr., 1608 Spruce St., Phila.[2]
1933. Gifford, U. Grant, Kennett Square, Pa.*
1920. Gill, A. Bruce, 1930 Chestnut St., Phila.*
1931. Gilman, Robert Louis, b.sc., m.d., m.sc. (med.), Assoc. Professor of Dermatology and Syphilology, Graduate School of Medicine and Associate in Dermatological Research, Univ. of Pa.; Asst. Physician, Philadelphia General Hospital. 1930 Chestnut St., Phila.
1927. Gilmour, William R., 6616 Woodland Ave., Phila.*
1931. Giordano, Anthony A. S., 1819 S. Broad St., Phila.*
1920. Githens, Thomas S., The Cambridge, Wissahickon and School Lane, Phila.*
1906. Gittings, John C., University Hospital, Phila.[5]
1905. Given, Ellis E. W., Sumneytown Rd., R.F.D. 1, Box 44A, Ambler Pa.*
1906. Goepp, R. Max, 1201 Medical Arts Bldg., Phila.*
1933. Goldburgh, Harold L., 1932 Spruce St., Phila.[5]
1935. Goldsmith, N. Ralph, Medical Arts Bldg., Phila.[3]
1905. Gordon, William, a.b., m.d., m.sc. (med.), Instructor in Otolaryngology, School of Medicine, Univ. of Pa.; Instructor in Otology, Graduate School of Medicine, Univ. of Pa.; Asst. Otolaryngologist, Hospital of the University of Pennsylvania; Asst. Otologist, Graduate Hospital

of the University of Pennsylvania, and Philadelphia Hospital for Contagious Diseases. 1721 Pine St., Phila.

1928. Gordon, Burgess L., 1832 Spruce St., Phila.*

1937. Gordon, William, 1721 Pine St., Phila.[5]

1894. Graham, Edwin E., 1713 Spruce St., Phila.*

1926. Grant, Francis Clark, a.b., m.d., Professor of Neurologic Surgery, School of Medicine and Graduate School of Medicine, Univ. of Pa. 3400 Spruce St., University Hospital, Phila.

1904. Grayson, Charles P., 262 S. 15th St., Phila.*

1933. Greenbaum, Sigmund S., b.s., m.d., Professor of Clinical Dermatology and Syphilology, Graduate School of Medicine, Univ. of Pa.; Visiting Dermatologist, Mt. Sinai Hospital; Visiting Dermatologist, Philadelphia General Hospital. 320 S. 18th St., Phila.

1932. Griffith, George C., a.b., m.d., Asst. Professor of Cardiology, Graduate School of Medicine, Univ. of Pa.; Assoc. Physician and Director, Dept. of Diseases of the Heart, Presbyterian Hospital. 4028 Walnut St., Phila.

1883. Griffith, J. P. Crozer, 1810 Spruce St., Phila.*

1934. Griffith, John Q., Jr., 214 Glencoe Ave., Upper Darby, Pa.[2]

1912. Griscom, J. Milton, Medical Tower, 255 S. 17th St., Phila.*

1933. Gruber, Charles M., Jefferson Medical College, Phila.[1]

1932. Guequierre, Jacques P., 1930 Chestnut St., Phila.*

1935. Hadden, Samuel Bernard, m.d., Neurologist, Presbyterian and Fitzgerald Mercy Hospitals; Visiting Psychiatrist, Philadelphia General Hospital; Associate in Neurology, School of Medicine, Univ. of Pa. 37 S. 20th St., Phila.

1935. Haines, Harlan F., 134 S. State Rd., Upper Darby, Pa.[3]

1894. Hamill, S. McC., 1822 Spruce St., Phila.*

1897. Hand, Alfred, Jr., 1724 Pine St., Phila.*

1938. Hand, John G., a.b., m.d., Clinical Asst. in Surgery, Episcopal Hospital, Children's Hospital of Mary J. Drexel Home. 1724 Pine St., Phila.

1932. Harris, Stanley E., Lansdowne, Pa.*

1929. Harrison, Francis G., 1900 Spruce St., Phila.*

1933. Harrison, William John, 135 S. 17th St., Phila.[1]

1903. Hart, Charles D., 420 W. Mermaid Lane, Chestnut Hill, Phila.*

1932. Hartman, J. Calvin, 100 W. Walnut Lane, Phila.*

1926. Hartmann, Fred L., 1914 Pine St., Phila.*

1935. Haskell, Benjamin F., 1426 Spruce St., Phila.[3]

1936. Hatch, Lerleen Clement, Univ. of Pa. Hospital, 36th and Spruce Sts., Phila.[4]

1907. Hatfield, Charles J., Phipps Institute, 7th and Lombard Sts., Phila.*

1911. Heed, Charles R., 1205 Spruce St., Phila.*

1927. Herman, Leon, 801 Medical Arts Bldg., Phila.*

1924. Hewson, William, 6013 Greene St., Phila.*
1924. Hirst, John C., 2d, 500 N. 20th St., Phila.*
1908. Hitchens, Arthur Parker, m.d., Asst. Professor of Military Science and Tactics, Univ. of Pa.; Lieut. Col., Medical Corps, U. S. Army. Room 234, Medical School, Univ. of Pa.
1905. Hodge, E. B., 2019 Spruce St., Phila.*
1931. Holland, H. Albert, 8200 Crittenden St., Chestnut Hill, Phila.*
1933. Hollingshead, Irving W., 123 S. 18th St., Phila.*
1932. Hollingsworth, I. Pemberton P., 411 N. Walnut St., West Chester, Pa.*
1919. Hopkins, Arthur H., 1726 Pine St., Phila.*
1925. Hopkinson, R. Dale, Jenkintown, Pa.*
1928. Houser, Karl M., 2010 Spruce St., Phila.*
1938. Howell, John Carnett, m.d., Asst. Professor of Surgery, Graduate School of Medicine, Univ. of Pa.; Assoc. in Surgery, School of Medicine, Univ. of Pa.; Visiting Surgeon, Radiological Dept., Philadelphia General Hospital; Asst. Surgeon, Presbyterian Hospital. 326 S. 19th St., Phila.
1908. Hoyt, Daniel M., Veterans' Bureau Hospital, St. Petersburg, Fla.*
1937. Hughes, Joseph, 4401 Market St., Phila.[5]
1892. Hughes, William E., 3945 Chestnut St., Phila.*
1937. Hughson, Walter, Abington Memorial Hospital, Abington, Pa.[5]
1923. Hume, John E., N.E. Corner 20th and Chestnut Sts., Phila.*
1921. Hunter, Robert John, m.d., Laryngologist, Philadelphia General Hospital; Assoc. Professor of Laryngology, Graduate School of Medicine, University of Pennsylvania; Laryngologist and Aurist, Lankenau Hospital. 2011 Chestnut St., Phila.
1926. Husik, David N., 1820 Spruce St., Phila.*
1934. Hustead, Frank H., 5112 N. Broad St., Phila.[5]
1898. Hutchinson, J. P., Media, Pa.*
1937. Ingle, Harry Barr, m.d. 1937 Fairmount Ave., Phila.
1935. Ingleby, Helen, Woman's Medical College, East Falls, Phila.[3]
1921. Ivy, Robert H., m.d., d.d.s., Professor of Maxillo-Facial Surgery, School of Medicine and Graduate School of Medicine, Univ. of Pa., Oral Surgeon, Presbyterian Hospital; Consulting Plastic Surgeon; Children's Hospital. 1930 Chestnut St., Phila.
1917. Jackson, Chevalier, 3701 N. Broad St., Phila.*
1932. Jackson, Chevalier Lawrence, 3701 N. Broad St., Phila.*
1934. Jacobs, Maurice S., A.B., M.D., Assoc. in Medicine, Temple University; Assoc. Cardiologist and Assoc. in Medicine, Jewish Hospital; Clinic Chief, City Chest Clinic No. 12. 1831 De Lancey Place, Phila.
1922. Jameson, H. Leon, 2133 S. 16th St., Phila.*
1913. Jeffreys, William H., Rosemont, Pa.*

1928. John, Rutherford L., 256 S. 21st St., Phila.*
1926. Johnson, George Ernest, 5341 Chester Ave., Phila.*
1938. Johnson, Thomas A., a.b., m.d., Instructor in Gastro-enterology, Graduate School of Medicine, Univ. of Pa. 250 S. 18th St., Phila.
1918. Jonas, Leon, 255 S. 17th St., Phila.*
1924. Jones, Harold W., 1930 Chestnut St., Phila.*
1900. Judson, Charles F., 1005 Spruce St., Phila.*
1902. Jump, Henry D., 2019 Walnut St., Phila.*
1936. Kain, Thomas M., 403 Cooper St., Camden, N. J.[3]
1938. Kasper, Kelvin A., m.d., Demonstrator of Laryngology, Jefferson Medical College; Associate Oral & Laryngeal Service, Episcopal Hospital. 135 S. 18th St., Phila.
1926. Kaufman, Isadore, 2054 Locust St., Phila.*
1923. Kay, James, 600 W. Olney Ave., Phila.*
1938. Keeler, Harold R., ph.b., m.d., Chief Visiting Physician, Methodist Episcopal Hospital. 1824 Spruce St., Phila.
1913. Kelly, Francis J., 2211 Locust St., Phila.*
1935. Kelly, George F. J., N.E. Cor. 20th and Chestnut Sts., Phila.[3]
1932. Kelly, Herbert T., 1900 Spruce St., Phila.*
1909. Kelly, James A., 1815 Spruce St., Phila.*
1912. Kelly, Thomas C., 105 School Lane, Phila.*
1921. Kern, Richard A., a.b., m.d., Professor of Clinical Medicine, School of Medicine and Graduate School of Medicine, Univ. of Pa. University Hospital, 36th & Spruce Sts., Phila.
1935. Keyes, Baldwin L., 2025 Walnut St., Phila.[3]
1930. Kimbrough, Robert Alexander, Jr., a.b., m.d., Asst. Professor of Obstetrics and Gynecology, School of Medicine, Univ. of Pa.; Assoc. Professor of Obstetrics, Graduate School of Medicine, Univ. of Pa.; Chief of Service B., Obstetrics and Gynecology, Woman's Clinic, Pennsylvania Hospital; Consulting Obstetrician, Chester County Hospital, West Chester, Pa. 807 Spruce St., Phila.
1936. King, Orville C., Medical Tower Bldg., 255 S. 17th St., Phila.[3]
1931. Kinney, Willard H., 315 S. 17th St., Phila.*
1920. Klauder, Joseph V., 1934 Spruce St., Phila.*
1920. Klein, Thomas, 250 S. 18th St., Phila.*
1934. Klemmer, Roland N., 439 N. Duke St., Lancaster, Pa.[5]
1934. Kline, Oram R., 414 Cooper St., Camden, N. J.[2]
1932. Klopp, John W., 913 Medical Arts Bldg., 16th and Walnut Sts., Phila.*
1919. Knipe, Norman L., 1930 Chestnut St., Phila.*
1908. Knowles, Frank C., 2035 Spruce St., Phila.*
1938. Knox, Andrew, m.d., 1930 Chestnut, St., Phila.
1925. Knox, Harry E., 719 66th Ave., Oak Lane, Phila.*
1914. Kolmer, John A., Cynwyd, Pa.*

1936. Konzelmann, Frank Williamson, 3638 N. 21st St., Phila.[3]
1932. Kornblum, Karl, b.s., m.d., Professor of Roentgenology, Jefferson Medical College. 9 Hathaway Circle, Wynnewood, Pa.
1904. Krauss, Frederick, 1930 Chestnut St., Phila.*
1914. Krumbhaar, Edward B., School of Medicine, University of Pennsylvania, Phila.*
1900. Krusen, Wilmer, Phila. College of Pharmacy, Phila.*
1932. Landis, Eugene M., m.d., ph.d., m.s. (hon.), Assistant Professor of Medicine and Research Assoc. in Pharmacology, School of Medicine, Univ. of Pa. Room 815, Maloney Bld., 36th & Spruce Sts., Phila.
1907. Langdon, H. Maxwell, 1530 Locust St., Phila.*
1933. Langdon, Roy L., 5917 Greene St., Germantown, Phila.*
1934. Laplace, Louis B., 1900 Rittenhouse Sq., Phila.[2]
1926. Laws, George M., 1907 Spruce St., Phila.[2]
1936. Leaman, William G., 3700 Baring St., Phila.[4]
1920. Leavitt, Frederic Headley, m.d., Asst. Professor of Neurology, Graduate School of Medicine, Univ. of Pa.; Assoc. Professor of Psychiatry, School of Medicine, Univ. of Pa.; Chief, Psychiatric Dept., Philadelphia General Hospital; Neuropsychiatrist, Lankenau Hospital. 1527 Pine St., Phila.
1934. Lee, Thomas B., 622 Cooper St., Camden, N. J.[2]
1908. Lee, Walter E., 1833 Pine St., Phila.*
1936. Lehrfeld, Louis, 1321 Spruce St., Phila.[5]
1935. Lemmon, William T., 1930 Chestnut St., Phila.[3]
1920. Leopold, Simon S., 2025 Spruce St., Phila.*
1933. Levering, J. Walter, 1309 Oak Lane, Phila.[1]
1915. Lewis, Fielding O., 259 S. 17th St., Phila.*
1938. Lewis, James P., m.d., Assoc. Gynecologist, Presbyterian Hospital; Asst. Obstetrician, Philadelphia General Hospital; Instructor in Gynecology, School of Medicine, Univ. of Pa. 3815 Chestnut St., Phila.
1936. Lillie, Walter I., 255 S. 17th St., Phila.[3]
1938. Lindauer, M. August, m.d., Asst. Instructor in Medicine, School of Medicine, Univ. of Pa.; Asst. in Cardiac Clinic, Hospital of Univ. of Pa.; Asst. in Outpatient Dept., Presbyterian Hospital; Volunteer Clinical Assistant, Mt. Sinai Hospital. 5901 Warrington St., Phila.
1927. Lindsey, Walter H., 810 W. Dauphin St., Phila.*
1936. Lintgen, Charles, m.d., Assoc. in Gynecology, Jefferson Medical College; Asst. Gynecologist, Jefferson Hospital. 1930 Chestnut St., Phila.
1936. Llewellyn, Thomas H., 739 N. 40th St., Phila.[4]
1907. Lodholz, Edward, Medical Laboratories, Univ. of Pa., Phila.*
1931. Loewenberg, S. A., 1905 Spruce St., Phila.*

1938. Long, Charles-Francis, a.b., m.d., Assoc. Physician, Medical Wards, Jewish and Episcopal Hospitals; Instructor in Gastro-enterology, Temple University School of Medicine; Medical Director, Bayuk Cigars Inc., Phila. 256 S. 21st St., Phila.

1933. Long, Esmond R., Henry Phipps Institute, 7th and Lombard Sts., Phila.[5]

1935. Long, William L., 2025 Walnut St., Phila.[3]

1893. Longaker, Daniel, 5702 Overbrook Ave., Phila.*

1931. Longaker, Edwin P., 41 E. Montgomery Ave., Ardmore, Pa.*

1936. Lucchesi, Pascal F., Philadelphia Hospital for Contagious Diseases, 4000 N. Front St., Phila.[4]

1921. Lucké, Balduin H. E., Medical School, Univ. of Pa., Phila.*

1924. Ludy, John B., 1201 Medical Arts Bldg., Phila.*

1923. Lueders, Charles W., 1930 Chestnut St., Phila.*

1932. Lukens, Francis D. W., a.b., m.d., Asst. Professor of Medicine, Univ. of Pa.; Director, George S. Cox Medical Research Institute, University of Pennsylvania. Cynwyd, Pa.

1938. Lukens, Philip J., m.d., Associate on Medical Staff, Chestnut Hill Hospital. 172 Butler Ave., Ambler, Pa.

1930. Lukens, Robert M., 1923 Spruce St., Phila.[2]

1929. Lull, Clifford B., Women's Bldg., Penna. Hosp., 807 Spruce St., Phila.*

1919. Lynch, Frank B., Jr., The Germantown Hospital, E. Wister St., Germantown, Phila.[5]

1914. Lyon, B. B. Vincent, 2031 Locust St., Phila.*

1933. McAndrews, Leo F., Times Medical Bldg., Ardmore, Pa.[1]

1932. McCahey, James F., 1534 Pine St., Phila.*

1900. McCarthy, Daniel J., 2025 Walnut St., Phila.*

1936. McCarthy, Patrick A., Central Medical Bldg., Phila.[3]

1935. McClenahan, William U., 3 Summit Ave., Chestnut Hill, Phila.[3]

1931. McCloskey, Edward, 7 E. Chestnut Ave., Chestnut Hill, Phila.*

1935. McConnell, James W., 20th and Chestnut Sts., Phila.[3]

1934. McCouch, Grayson P., Medical School, University of Pa., Phila.[2]

1938. McCrea, Lowrain E., m.d., Asst. Professor of Urology, School of Medicine, Temple Univ.; Attending Urologist, Philadelphia General Hospital. 1930 Chestnut St., Phila.

1937. McCutcheon, Morton, a.b., m.d. Alden Park Manor, Germantown, Phila.

1895. McFarland, Joseph, 542 W. Hortter St., Germantown, Phila.*

1937. McGuinness, Aims C., The Children's Hospital, 1740 Bainbridge St., Phila.[5]

1931. McIver, Joseph, 255 S. 17th St., Phila.[3]

1933. McLaughlin, James S., 334 S. 21st St., Phila.*

1924. McMillan, Thomas M., 2044 Locust St., Phila.*

1924. McPhedran, F. Maurice, Germantown Hosp., Penn and Chew Sts., Phila.*
1932. Macfarlane, Catharine, Medical Arts Bldg., Phila.*
1910. Mackinney, William H., 1930 Chestnut St., Phila.*
1936. MacMurtrie, Wm. J., 912 S. 49th St., Phila.[4]
1935. Maeder, LeRoy M. A., M.A., M.D., LL.B., Instructor in Psychiatry, Graduate School of Medicine, Univ. of Pa. 206 S. 13th St., Phila.
1935. Maier, Ernest G., 1323 N. 15th St., Phila.[5]
1914. Maier, F. Hurst, 2019 Walnut St., Phila.*
1936. Mann, Bernard, 2019 Pine St., Phila.[4]
1937. Margolies, Alexander, 1836 Delancey St., Phila.[4]
1935. Mason, James B., 3815 Chestnut St., Phila.[3]
1935. Matthews, Robert A., 111 N. 49th St., Phila.[4]
1932. Meade, Richard H., Jr., Miquon, Pa.[2]
1934. Mecray, Paul M., 405 Cooper St., Camden, N. J.[2]
1914. Mencke, J. Bernhard, 1816 Spruce St., Phila.*
1923. Mendelson, Walter, 639 Church Lane, Germantown, Phila.*
1937. Meyer, George Phillip, M.D., Assoc. in Ophthalmology, School of Medicine, Univ. of Pa. 410 Haddon Ave., Camden, N. J.
1894. Miller, D. J. Milton, 104 S. Jackson Ave., Ventnor, N. J.*
1935. Miller, Ford A., 4016 Chestnut St., Phila.[3]
1934. Miller, Hugh McC., 1614 Locust St., Phila.[2]
1932. Miller, M. Valentine, 114 W. Phil-Ellena St., Phila.[2]
1921. Miller, T. Grier, University Hospital, 36th and Spruce Sts., Phila.[5]
1937. Missett, Joseph Vincent, Jr., 1814 Spruce St., Phila.[5]
1904. Mitchell, Charles F., 2003 Pine St., Phila.*
1921. Mohler, Henry K., 319 S. 16th St., Phila.*
1932. Mohler, Roy W., 1806 Spruce St., Phila.[5]
1936. Montgomery, Hugh, 216 Kent Rd., Ardmore, Pa.[4]
1936. Montgomery, John B., 1930 Chestnut St., Phila.[4]
1932. Montgomery, Thaddeus L., B.A., M.D., Clinical Professor of Obstetrics, Jefferson Medical College; Asst. Obstetrician, Jefferson Hospital. 1930 Chestnut St., Phila.
1928. Moon, Virgil H., Jefferson Medical College, Phila.*
1935. Moore, John Royal, Beury Bldg., Broad St. and Erie Ave., Phila.[3]
1924. Moorhead, Stirling W., 1523 Pine St., Phila.[5]
1918. Morgan, Arthur C., 1930 Chestnut St., Phila.*
1936. Morgan, David R., Jefferson Medical College, Phila.[3]
1886. Morris, Caspar, Haverford, Pa.*
1893. Morris, Elliston J., 128 S. 18th St., Phila.*
1929. Mudd, Stuart, School of Medicine, Univ. of Penna., Phila.*
1935. Mullen, Carroll Richard, 255 S. 17th St., Phila.[5]
1934. Mullen, Edward A., 2615 W. Somerset St., Phila.[2]

1905. Muller, George P., m.d., d.sc., Professor of Surgery, Jefferson Medical College; Surgeon, Jefferson, Lankenau and Misericordia Hospitals. 1930 Spruce St., Phila.

1930. Murphy, Douglas P., 3815 Chestnut St., Phila.*

1934. Murphy, Eugene C., 1841 S. Broad St., Phila.[2]

1905. Mutschler, Louis H., 1625 Spruce St., Phila.*

1902. Nassau, Charles F., m.d., ll.d., sc.d., Clinical Professor of Surgery, Jefferson Medical College; Surgeon, St. Joseph's Hospital; Chief Surgeon, Frankford Hospital; Surgeon, Girard College. 1710 Locust St., Phila.

1887. Neilson, Thomas Rundle, a.m., m.d., Surgeon Emeritus, Episcopal Hospital; Consulting Surgeon, St. Christopher's Hospital for Children; Emeritus Professor of Genito-Urinary Surgery, School of Medicine, Univ. of Pa. 1937 Chestnut St., Phila.

1936. Nelson, Guy M., 928 Clinton St., Phila.[3]

1905. Newcomet, William S., 3501 Baring St., Phila.*

1905. Newlin, Arthur, 1804 Pine St., Phila.*

1938. Newton, Zachariah B., b.s., m.d., Chief in Obstetrics and Gynecology, Roxborough Memorial Hospital; Assoc. Obstetrician, Chestnut Hill Hospital; Asst. Obstetrician, Germantown Hospital; Asst. Obstetrician and Gynecologist, Kensington Hospital for Women. 7109 McCallum St., Mt. Airy, Phila.

1935. Nicholson, Jesse Thompson, 1614 Locust St., Phila.[5]

1899. Nicholson, William Rufus, 2023 Spruce St., Phila.[2]

1905. Norris, Charles C., 133 S. 36th St., Phila.*

1938. Norris, Robert F., a.b., m.d., Asst. Director Ayer Clinical Laboratory, Pennsylvania Hospital. Pennsylvania Hospital, 8th and Spruce Sts., Phila.

1933. Nylin, Josef B., University Hospital, Phila.[1]

1913. O'Neal, Alexander Hay, St. Davids, Pa.*

1936. Orr, Theodore E., 1930 Chestnut St., Phila., Pa.[5]

1913. Outerbridge, George W., 1927 Spruce St., Phila.*

1915. Owen, Hubley R., 319 S. 16th St., Phila.*

1897. Packard, Francis R., 304 S. 19th St., Phila.*

1933. Palmer, Harold D., 111 N. 49th St., Phila.[1]

1906. Pancoast, Henry K., 544 S. Bowman Ave., Merion, Pa.*

1909. Parish, Benjamin Dores, b.s., m.d., Oto-Laryngologist, Chestnut Hill Hospital; Consultant, St. Agnes Hospital, Oncological Hospital, Kensington Hospital for Women, Phila., and Norristown State Hospital for the Insane. 1927 Spruce St., Phila.

1931. Paul, John Davis, 3112 N. Broad St., Phila.*

1932. Payne, Franklin L., 133 S. 36th St., Phila.*

1922. Pelouze, P. S., 1737 Chestnut St., Phila.*

1909. Pemberton, Ralph, Paoli, Pa.*

1930. Pendergrass, Eugene Percival, m.d., Professor of Radiology, School of Medicine and Graduate School of Medicine, Univ. of Pa.; Assoc. Director, Department of Radiology, Univ. of Pa. Hospital. 3400 Spruce St., Phila.

1932. Pennell, Howard Y., West Chester, Pa.*

1914. Pepper, O. H. Perry, b.s., m.d., sc.d., Professor of Medicine, School of Medicine, Univ. of Pa. University Hospital, 36th and Spruce Sts., Phila.

1902. Pepper, William, School of Medicine, Univ. of Pa., Phila.*

1916. Percival, Milton F., 2332 S. Broad St., Phila.*

1917. Peter, Luther C., a.m., m.d., sc.d., l.l.d., Professor of Ophthalmology, Graduate School of Medicine, Univ. of Pa.; Ophthalmologist, Graduate Hospital, Friend's Hospital for Nervous and Mental Diseases, Rush Hospital for Consumptive and Allied Diseases. 1930 Chestnut St., Phila.

1937. Pettit, Horace, 135 Rose Lane, Haverford, Pa.[5]

1905. Pfahler, George E., 1930 Chestnut St., Phila.*

1915. Pfeiffer, Damon B., 1822 Pine St., Phila.*

1935. Phillips, Arthur W., 3904 Walnut St., Phila.[3]

1911. Piersol, George Morris, b.s., m.d., Professor of Medicine, Graduate School of Medicine, Univ. of Pa.; Director of Medical Service, Abington Memorial Hospital; Active Consultant in Medicine, Philadelphia General Hospital. 2031 Locust St., Phila.

1933. Pillsbury, Donald M., m.a., m.d., Assoc. Professor of Dermatology and Syphilology, School of Medicine, Univ. of Pa.; Asst. Professor of Dermatology and Syphilology, Graduate School of Medicine Univ. of Pa. 133 S. 36th St., Phila.

1905. Pitfield, Robert L., 5211 Wayne Ave., Phila.*

1922. Pleasants, Henry, Jr., West Chester, Pa.*

1937. Polk, David Stewart, Rosemont, Pa.[5]

1932. Porter, Roland De Lance, Jenkintown, Pa.*

1931. Pryor, Charles Allen, 1910 Spruce St., Phila.[2]

1931. Ramsey, Frank M., Chestnut Hill, Phila.*

1913. Randall, Alexander, 1323 Medical Arts Bldg., Phila.*

1926. Ravdin, I. S., b.s., m.d., Harrison Professor of Surgery, School of Medicine, Univ. of Pa.; Surgeon, Hospital of the Univ. of Pa.; Director, Harrison Department of Surgical Research, Univ. of Pa. 3400 Spruce St., Phila.

1938. Read, Hilton Shreve, m.d., Asst. Visiting Physician, Atlantic City Hospital; Visiting Physician and Gastroenterologist, Atlantic County Hospital for the Tuberculous. 5407 Atlantic Ave., Atlantic City, N. J.

1928. Reese, Warren S., 1901 Walnut St., Phila.*

1925. Reeves, Rufus S., 2227 Spruce St., Phila.*

1931. Regester, Robert P., 255 S. 17th St., Phila.*
1920. Rehfuss, Martin E., N.E. Corner 16th and Spruce Sts., Phila.*
1921. Reiff, E. Paul, a.b., m.d., Physician-in-Chief, Methodist Episcopal Hospital, Phila. 1927 Spruce St., Phila.
1937. Reimann, Hobart A., Jefferson Hospital, Phila.[5]
1919. Reimann, Stanley P., 703 W. Phil-Ellena St., Germantown, Phila.*
1929. de Rényi, George S., 212 S. 39th St., Phila.*
1923. Repplier, Sidney J., 373 Roumfort Rd., Mt. Airy, Phila.*
1936. Richards, James L., 1930 Chestnut St., Phila.[4]
1919. Richardson, Russell, 320 S. 16th St., Phila.*
1919. Ridpath, Robert F., m.d., sc.d., Professor of Rhino-Laryngology, Temple University School of Medicine; Chief of Rhino-Laryngology, Temple University Hospital. 1737 Chestnut St., Phila.
1898. Riesman, David, m.d., sc.d., ll.d., Professor of the History of Medicine and Professor Emeritus of Clinical Medicine, School of Medicine, Univ. of Pa.; Professor of Clinical Medicine, Graduate School of Medicine, Univ. of Pa.; Physician, Philadelphia General Hospital. 1520 Spruce St., Phila.
1936. Ritter, Joseph A., N.E. Cor. 54th and Gainor Rd., Phila.[4]
1933. de Rivas, Damaso, Lansdowne, Pa.[1]
1932. Robbins, Frederick R., 255 S. 17th St., Phila.*
1899. Roberts, Walter, 1921 Spruce St., Phila.*
1932. Robertson, Harold F., 327 S. 17th St., Phila.*
1903. Robertson, William Egbert, 327 S. 17th St., Phila.*
1938. Roche, Philip Q., m.d., Psychiatrist, Eastern State Penitentiary; Instructor in Neurology, Graduate School of Medicine, Univ. of Pa.; Asst. Neurologist, Lankenau Hospital; Asst. Physician, Orthopaedic Hospital. 255 S. 17th St., Phila.
1912. Rodman, John Stewart, 524 Manor Rd., Wynnewood, Pa.*
1934. Rogers, Harry L., Riverton, N. J.[2]
1928. Rose, Edward, 255 S. 17th St., Phila.*
1936. Rose, Elizabeth Kirk, 426 Owen Rd., Wynnewood, Pa.[5]
1909. Rosenberger, Randle C., 1001 Walnut St., Phila.*
1932. Rothrock, Harry A., West Chester, Pa.*
1936. Rothschild, Norman, 235 S. 15th St., Phila.[3]
1933. Rowntree, Leonard George, 1520 Spruce St., Phila.[1]
1937. Roxby, John B., Dept. of Anatomy, Temple University, Broad and Ontario Sts., Phila.[4]
1933. Rudolphy, Jay Besson, m.d., Asst. Professor of Ophthalmology, Graduate School of Medicine, Univ. of Pa.; Neuro-Ophthalmologist, Philadelphia General Hospital; Ophthalmologist and Chief of Out-Patient Clinic, Pennsylvania Hospital; Asst. Ophthalmologist, Lankenau Hospital. 230 S. 21st St., Phila.
1905. Rugh, J. Torrance, 911 Medical Arts Bldg., Phila.*

1929. Ryan, William J., Medical Arts Bldg., Phila.*
1936. Sands, Joseph Evans, Rosemont, Pa.[5]
1905. Sartain, Paul J., 2006 Walnut St., Phila.*
1908. Sautter, Albert C., Germantown Professional Bldg., Phila.*
1927. Saxon, Gordon J., 5314 Spruce St., Phila.*
1906. Saylor, Edwin S., 1737 Chestnut St., Phila.*
1920. Scarlett, Hunter W., 230 S. 21st St., Phila.*
1917. Schaeffer, J. Parsons, 4634 Spruce St., Phila.*
1932. Schaffer, Howard W., b.s., m.d., Physician, Philadelphia General Hospital; Director of Laboratory, Memorial Hospital of Roxborough; Instructor, School of Medicine, Univ. of Pa.; Chief, Diabetic Clinic, Germantown Hospital. 269 S. 21st St., Phila.
1929. Scheffey, Lewis Cass, m.d., p.d., Clinical Professor of Gynecology, Jefferson Medical College; Asst. Gynecologist, Jefferson Medical College Hospital. 255 S. 17th St., Phila.
1929. Schenck, Harry P., 1912 Spruce St., Phila.*
1917. Schnabel, Truman G., a.b., m.d., Associate Professor of Medicine, School of Medicine, Univ. of Pa.; Physician, Philadelphia General and Presbyterian Hospitals. 1704 Pine St., Phila.
1917. Schoff, Charles H., Media, Pa.*
1928. Schofield, Frederick S., 822 Medical Arts Bldg., Phila.*
1921. Schumann, Edward A., 1814 Spruce St., Phila.*
1930. Scott, John P., Children's Hospital, 1740 Bainbridge St., Phila.*
1917. Service, Charles A., Bala, Pa.*
1924. Shallow, Thomas A., m.d., Professor of Surgery, Jefferson Medical College; Surgeon, Jefferson Hospital; Neurosurgeon, Philadelphia General Hospital; Director of Surgery, Delaware County Hospital. 1611 Spruce St., Phila.
1908. Shannon, Charles E. G., 1930 Chestnut St., Phila.*
1928. Sharpe, John S., Haverford, Pa.*
1928. Sharpless, Frederick C., Rosemont, Pa.*
1897. Sharpless, William T., West Chester, Pa.*
1931. Sheehan, William C., 8314 Germantown Ave., Phila.*
1932. Sheridan, Joyce T., 412 W. Durham St., Phila.*
1906. Shields, William G., m.d., Director of Outpatient Dept., Germantown Hospital; Dermatologist, Germantown Hospital. 414 School Lane, Germantown, Phila.
1936. Shipman, James Shelby, 542 Cooper St., Camden, N. J.[3]
1935. Shoemaker, Robert, 3rd, 68 Byberry Rd., Hatboro, Pa.[3]
1896. Shoemaker, William T., 2017 Locust St., Phila.*
1900. Shumway, Edward A., 1737 Chestnut St., Phila.*
1936. Shuster, Benjamin H., 1824 Pine St., Phila.[3]
1903. Sinclair, John F., 4103 Walnut St., Phila.*
1907. Sinkler, Francis W., 1226 Medical Arts Bldg., Phila.*

1902. Siter, E. Hollingsworth, 2213 Delancey Place, Phila.*
1928. Skillern, Samuel R., 1734 Pine St., Phila.*
1933. Smelzer, Donald Campbell, Graduate Hospital, Phila.[1]
1929. Smith, Austin T., m.d., Asst. Professor of Laryngology, Jefferson Medical College; Asst. Laryngologist, Jefferson Medical College Hospital; Consulting Laryngologist, Vineland Training School, Vineland, N. J. 259 S. 17th St., Phila.
1933. Smith, Lauren H., 111 N. 49th St., Phila.[1]
1937. Smith, Lawrence Weld, a.b., m.d., Professor of Pathology, Temple University School of Medicine; Pathologist, Director of Laboratories, Temple University Hospital; Visiting Pathologist, Philadelphia General Hospital. Temple School of Medicine, North Broad and Ontario Sts., Phila.
1936. Smith, Richard Manges, 329 S. 12th St., Phila.[3]
1927. Smyth, Calvin Mason, b.s., m.d., Asst. Professor of Surgery, Graduate School of Medicine, Univ. of Pa.; Surgeon in Chief, Methodist Episcopal Hospital; Director of Surgery, The Woman's Hospital; Visiting Surgeon, Abington Memorial Hospital. Medical Arts Bldg., Phila.
1919. Smyth, Henry Field, Hygiene Laboratory, Univ. of Pa., Phila.*
1938. Snodgrass, L. E., a.b., m.d., Instructor in Surgery, Graduate School of Medicine, Univ. of Pa.; Clinical Asst. in Surgery and Associate in Thyroid Clinic, Episcopal Hospital; Asst. Surgeon, Philadelphia Orthopaedic Hospital. 2528 N. 5th St., Phila.
1935. Sokoloff, Martin J., m.d., Associate in Medicine, Jefferson Medical College; Visiting Physician, White Haven Sanatorium, White Haven, Pa. 255 S. 17th St., Phila.
1922. Solis-Cohen, Leon, a.b., m.d., Radiologist, Jewish Hospital; Radiologist, Memorial Hospital of Roxborough. 1923 Spruce St., Phila.
1935. Sommer, George N. J., 120 W. State St., Trenton, N. J.[5]
1933. Southworth, Varnum C., Germantown Professional Bldg., Phila.[1]
1933. Spackman, Edgar W., Hamilton Court, 39th and Chestnut Sts., Phila.*[2]
1928. Spaeth, Edmund B., 1930 Chestnut St., Phila.*
1937. Spangler, John Luther, Devon, Pa.[5]
1935. Spiegel, Ernest, 6807 Lawnton Ave., Oak Lane, Phila.[3]
1897. Spiller, William G., 4409 Pine St., Phila.[5]
1929. Sponsler, Marshall B., 1934 Spruce St., Phila.[5]
1894. Stahl, B. Franklin, Haverford, Pa.*
1909. Starbuck, J. Clinton, 42 East Washington St., Media, Pa.*
1927. Starr, Isaac, 505 Cresheim Valley Rd., Phila.*
1936. Steinfield, Edward, N.E. Cor. 18th and Chestnut Sts., Phila.[3]
1895. Stengel, Alfred, Maloney Clinic, University Hospital, 36th and Spruce Sts., Phila.*
1901. Stevens, Arthur A., 314 S. 16th St., Phila.*

1914. Stewart, Thomas S., Bellevue Stratford Hotel, Phila.*
1931. Stiles, Merritt H., 113 W. Chestnut Ave., Phila.*
1934. Stimson, Cheney M., 167 Harvey St., Germantown, Phila.[5]
1925. Stokes, John H., A.B., M.D., Director, Institute for the Control of Syphilis, Univ. of Pa.; Special Consultant, U. S. Public Health Service. 4228 Spruce St., Phila.*
1928. Stokes, Joseph, Jr., 159 W. Coulter St., Phila.*
1923. Strecker, Edward A., 111 N. 49th St., Phila.*
1923. Stroud, William D., 1011 Clinton St., Phila.*
1937. Strumia, Max M., Bryn Mawr Hospital, Bryn Mawr, Pa.[5]
1933. Stuckert, Harry, 248 S. 21st St., Phila.*
1937. Sturgis, Margaret C., 1930 Chestnut St., Phila.[5]
1927. Sturgis, Samuel Booth, M.D., Physician, Bryn Mawr Hospital. 34 W. Montgomery Ave., Ardmore, Pa.
1934. Summey, Thomas J., 1930 Chestnut St., Phila.[2]
1930. Sunderman, F. William, 2210 Delancey St., Phila.*
1936. Surver, James Miller, 1832 Spruce St., Phila.[5]
1928. Swartley, William B., 6002 Greene St., Phila.*
1934. Sweeney, John A., 1900 Rittenhouse Sq., Phila.[2]
1900. Talley, James Ely, Lima, Del. Co., Pa.*
1933. Taylor, Herbert W., Haverford, Pa.[1]
1931. Taylor, Norman H., 100 W. Evergreen Ave., Phila.*
1928. Thomas, J. Earl, Drexel Hill, Pa.*
1907. Thomas, T. Turner, 1737 Chestnut St., Phila.*
1927. Thorington, J. Monroe, 2031 Chestnut St., Phila.*
1898. Thornton, Edward Q., 1331 Pine St., Phila.*
1936. Thornton, Mary Bickings-, 2703 West Somerset St., Phila.[4]
1936. Thorp, Francis Quicksall, 1367 Oxford St., Phila.[3]
1930. Thorpe, Edward S., Jr., B.S., M.D., Asst. Professor of Pediatrics, School of Medicine and Graduate School of Medicine, Univ. of Pa.; Assistant to the Dean, School of Medicine, Univ. of Pa.; Pediatrician, Philadelphia General Hospital. School of Medicine, Univ. of Pa., Phila.
1936. Thudium, William J., M.D., Associate in Gynecology, Jefferson Medical College; Visiting Gynecologist, St. Joseph's Hospital; Visiting Gynecologist and Obstetrician, Philadelphia General Hospital. Medical Arts Bldg., Phila.
1935. Tocantins, L. M., 350 E. Meehan Ave., Germantown, Phila.[5]
1935. Toland, Owen J., 1806 Spruce St., Phila.[3]
1912. Torrey, Robert G., 1716 Locust St., Phila.*
1936. Towson, Charles Emory, Germantown Professional Bldg., Phila.[5]
1934. Tracy, Martha, B.A., M.D., DR.P.H., Dean, Woman's Medical College of Pennsylvania. 516 W. Coulter St., Phila.
1908. Tracy, Stephen E., 1930 Chestnut St., Phila.*

1926. Tucker, Gabriel, 326 S. 19th St., Phila.[3]
1938. Tuft, Louis, m.d., Associate in Medicine, Temple University; Consulting Pathologist, Willow Crest Sanitarium. 1530 Locust St., Phila.
1933. Tumen, Henry J., 2022 Spruce St., Phila.[1]
1938. Turman, Christopher M., b.s., m.d., Associate Obstetrician, Episcopal Hospital; Asst. Obstetrician, Germantown and Abington Hospitals; Instructor in Obstetrics and Gynecology, Graduate School of Medicine, Univ. of Pa. Wyncote, Pa.
1935. Turnbull, William G., Phila. General Hospital, Phila.[3]
1923. Turner, Creighton H., 1731 Pine St., Phila.*
1929. Tyson, Ralph M., 255 S. 17th St., Phila.[5]
1937. Uhle, Charles A. W., 7939 Winston Rd., Chestnut Hill, Phila.[5]
1907. Ullom, Josephus T., Carpenter and Quincy Sts., Phila.*
1934. Ulrich, George A., 309 S. 12th St., Phila.[2]
1937. Vander Veer, Joseph B., 302 S. 19th St., Phila.[5]
1937. Van Loon, Emily Lois, 1930 Chestnut St., Phila.[4]
1933. Vastine, Jacob H. 2nd, m.d., Clinical Professor of Radiology, Woman's Medical College; Asst. Professor of Radiology, Graduate School of Medicine, Univ. of Pa.; Radiologist, Woman's College Hospital and St. Christopher's Hospital. Medical Arts Bldg., Phila.
1912. Vaux, Norris Wistar, 807 Spruce St., Phila.[5]
1903. Wadsworth, William S., 3914 Baltimore Ave., Phila.*
1927. Wagers, Arthur J., m.d., Assistant Professor of Laryngology, Jefferson Medical College; Chief Clinical Asst., Laryngological Service, Jefferson Hospital; Otologist, Joseph Price Memorial Hospital. 1429 Spruce St., Phila.
1928. Wagoner, George W., Haverford Gables, Haverford, Pa.*
1938. Waldman, Joseph, m.d., Clinical Asst., Ophthalmologic Service, Jefferson Hospital; Asst. Pathologist, Wills Eye Hospital; Attending Ophthalmologist, Philadelphia Home for Incurables; Demonstrator in Ophthalmology, Jefferson Medical College. 1930 Chestnut St., Phila.
1931. Walker, Herschel C., Wynnewood, Pa.*
1906. Walker, John K., Media, Pa.[3]
1907. Walker, Warren, 1819 Chestnut St., Phila.*
1932. Walkling, Adolph A., m.d., Asst. Surgeon, Jefferson Hospital; Asst. Surgeon, Pennsylvania Hospital; Asst. Professor of Surgery, Jefferson Medical College. Medical Arts Bldg., Phila.
1904. Walsh, Joseph, 521 Medical Arts Bldg., Phila.*
1895. Watson, Arthur W., 2013 Locust St., Phila.[5]
1932. Watt, Charles C., Jr., 6605 Wayne Ave., Phila.*
1933. Waygood, James Jamison, 3464 W. School Lane, Phila.[1]
1903. Weber, Charles H., 250 S. 18th St., Phila.*

1930. WEEDER, S. DANA., M.D., Surgeon, Germantown Hospital; Assoc. Surgeon, Chestnut Hill Hospital. 6110 Greene St., Phila.

1920. WEIDMAN, FRED D., M.D., Professor of Dermatological Research, School of Medicine, Univ. of Pa.; Vice-Dean for Dermatology, Syphilology and Professor of Dermatology, Graduate School of Medicine, Univ. of Pa.; Attending Dermatologist, Philadelphia General Hospital; Associate Pathologist, Philadelphia Zoological Garden. 20 Tenby Rd., Llanerch, Pa.

1933. WEISS, BENJAMIN P., The Lenox, 13th and Spruce Sts., Phila.[5]

1923. WEISS, EDWARD, 1923 Spruce St., Phila.[4]

1935. WHELAN, GEORGE L., 2100 Walnut St., Phila.[3]

1921. WHITAKER, WILLIAM, 5448 Germantown Ave., Phila.*

1936. WHITE, ELLEN PAWLING CORSON-, 1820 Pine St., Phila.[4]

1925. WIDMANN, BERNARD P., 250 S. 18th St., Phila.*

1936. WILDER, THEODORE S., Germantown Professional Bldg., Greene and Coulter Sts., Phila.[4]

1936. WILKINSON, RICHARD POWERS, PH.G., M.D., Physician, Moyamensing Prison. 1613 S. Broad St., Phila.

1914. WILLARD, DE FOREST P., 1726 Spruce St., Phila.*

1935. WILLARD, JOHN H., A.B., M.D., Instructor in Gastroenterology, Graduate School of Medicine, Univ. of Pa.; Chief of Gastro-Intestinal Service, Abington Memorial Hospital, Abington, Pa. 2022 Locust St., Phila.

1907. WILLIAMS, CARL, School Lane and Green St., Phila.*

1924. WILLIAMS, HORACE JAMES, 5908 Greene St., Phila.[5]

1937. WILLIAMS, JOHN C., M.D., Pediatrician, Germantown Hospital; Instructor in Pediatrics, Graduate School of Medicine, Univ. of Pa. 6370 Germantown Ave., Phila.

1920. WILLIAMS, PHILIP F., 2206 Locust St., Phila.*

1927. WILLIAMSON, ERNEST G., 6353 Woodbine Ave., Phila.*

1916. WILMER, HARRY BOND, M.D., Asst. Professor of Clinical Allergy, Graduate School of Medicine, Univ. of Pa.; Director of Medical Services and Physician-in-Chief, Dept. of Allergy, Abington Memorial Hospital; Assoc. Physician and Chief of Department of Allergy, Presbyterian Hospital. 6013 Greene St., Germantown, Phila.

1921. WILSON, GEORGE, 133 S. 36th St., Phila.*

1937. WILSON, ROSS B., M.A., M.D., Asst. Obstetrician and Gynecologist, Philadelphia Lying-in Hospital; Asst. Obstetrician, Lankenau Hospital. 1820 S. Rittenhouse Sq., Phila.

1902. WILSON, SAMUEL M., 1930 Chestnut St., Phila.*

1897. WILSON, W. REYNOLDS, Villa Nova, Pa.*

1904. WISTER, JAMES W., 5430 Germantown Ave., Phila.*

1933. WOHL, MICHAEL G., 1727 Pine St., Phila.[1]

1918. WOLFERTH, CHARLES C., A.B., M.D., Professor of Clinical Medicine, School of Medicine, Univ. of Pa.; Budget Administrator of Robinette Foundation, Univ. of Pa.; Consulting Physician, Fitzgerald Mercy and St. Joseph's Hospitals, and Underwood Hospital, Woodbury, N. J.; Consulting Cardiologist, Jewish Hospital. 26 Raynham Rd., Merion, Pa.

1893. Wood, Alfred C., 2035 Walnut St., Phila.*
1932. Wood, Francis C., Wynnewood, Pa.*
1900. Wood, George B., N.E. Corner 20th and Chestnut Sts., Phila.*
1903. Wood, Horatio C., 319 S. 41st St., Phila.*
1897. Woodward, George, W. Willow Grove Ave., Chestnut Hill, Phila.*
1928. Wright, Carroll S., 1402 Spruce St., Phila.*
1937. Yaskin, Joseph C., 1832 Spruce St., Phila.[5]
1894. Zentmayer, William, 1930 Chestnut St., Phila.*
1895. Zimmerman, Mason W., m.d., ph.g., Retired. 1518 Waverly St., Phila.
1933. Zulick, J. Donald, 2008 Walnut St., Phila.[1]

Non-Resident Fellows

For degrees and titles when not listed see notation p. 392 .

ELECTED

1916. Bell, Rear Admiral William H., M.C., U.S.N., 5 W. Blackthorn St., Chevy Chase, Md.*

1903. Biggs, M. H., Rutherfordton, N. C.*

1936. Brown, Clark E., Santa Barbara Cottage Hospital, Santa Barbara, California.[5]

1908. Cadbury, William W., Dr. Sun Yat Sen Medical College, Lingnan University, Canton, China.*

1936. Clarke, Francis Mann, 116 New St., New Brunswick, N. J.[3]

1937. Conaway, W. P., 1723 Pacific Ave., Atlantic City, N. J.[5]

1936. Cooper, Melbourne J., m.d., Visiting Physician Santa Rosa Hospital, Nix Memorial Hospital, and Medical & Surgical Hospital of San Antonio; Neurologist, Robert B. Green Memorial Hospital, San Antonio. Nix Professional Building, 414 Navarro St., San Antonio, Texas.

1936. Dickson, John McCrea, 103 W. Middle St., Gettysburg, Pa.[4]

1897. Dorland, W. A. Newman, a.m., m.d., Professor of Gynecology, Illinois Post-Graduate Medical School; Diplomate, American Board of Obstetrics and Gynecology. 4512 Sheridan Road, Chicago, Ill.

1905. Evans, Joseph S., Jr., 1300 University Ave., Madison, Wis.*

1935. Fretz, John Edgar, a.b., a.m., m.d., Physician, Easton Children's Home; Consultant, Warren Hospital, Phillipsburg, N. J. 114 N. 3rd St., Easton, Pa.

1913. Gates, Nathaniel, 10 Peterboro Ave., Detroit, Mich.*

1908. Goodman, Edward H., Dorset, Vt.*

1936. Guthrie, Donald, ph.b., m.d., d.sc., Assoc. Professor of Surgery, Graduate School of Medicine, Univ. of Pa.; Chief Surgeon, Robert Packer Hospital, Sayre, Pa.; Chief Surgeon, Lehigh Valley Railroad. S. Wilbur Ave., Sayre, Pa.

1902. Gwyn, Norman B., 109 Madison Ave., Toronto, Canada.*

1928. Hayman, Joseph M., Lakeside Hospital, Cleveland, O.*

1935. Hill, Emory, a.b., m.d., Professor Emeritus of Ophthalmology, Medical College of Va.; Consulting Ophthalmologist, Hospital Division, Medical College of Va. Professional Bldg., Richmond, Va.

1892. Hinsdale, Guy, a.b., a.m., m.d., Medical Director, White Sulphur Springs, Inc.; Amer. Representative, Internat. Soc. Medical Hydrology. White Sulphur Springs, W. Va.

1933. Hitzrot, Lewis H., Medical Director, Mercersburg Academy, Mercersburg, Pa.[4]
1936. Hughes, Brady A., 5005 42d Place, North; Birmingham, Ala.[4]
1912. Hunter, John W., McDaniel, Md.*
1885. Jackson, Edward, Republic Bldg., Denver, Colo.*
1900. Jopson, John H., Waverly Mills, S. C.*
1887. Kelly, Howard A., 1418 Eutaw Place, Baltimore, Md.*
1935. McGuire, Hunter H., 105 N. Braddock St., Winchester, Va.[3]
1900. McReynolds, Robert Phillips, 213 S. Broadway, Los Angeles, Cal.*
1911. Meigs, Edward B., 1736 M St., N.W., Washington, D. C.*
1936. Middleton, William Shainline, Univ. of Wisconsin, Madison, Wis.[3]
1917. Mitchell, A. Graeme, m.d., Professor of Pediatrics, Univ. of Cincinnati; Director of Childrens' Hospital Research Foundation; Medical Director of The Children' Hospital, of the Childrens' Dept. of the Cincinnati General Hospital and of the Contagious Disease Hospital, Cincinnati, Ohio. Childrens' Hospital Research Foundation, Cincinnati, Ohio.
1915. Musser, John H., 1430 Tulane Ave., New Orleans, La.[3]
1937. Nicholson, Samuel T., 2d, The Hill School, Pottstown, Pa.[4]
1905. Norris, George W., Dimock, Pa.*
1901. Norris, Henry, Waverly Mills, S. C.*
1899. Parke, William E., 417 W. 30th St., Miami Beach, Fla.*
1926. Paul, John Rodman, Dept. Internal Medicine, Yale University, New Haven, Conn.*
1907. Price, George E., Stimson Bldg., Seattle, Wash.*
1936. Quiney, James J., 208 Lafayette Building, Easton, Pa.[3]
1904. Ravenel, M. P., 203 Westmont Ave., Columbia, Mo.*
1936. Reisinger, John A., a.b., m.d., Chief, Cardiovascular Unit, U. S. Veterans Administration; Instructor in Clinical Medicine, Georgetown Univ. Medical School. 6355 31st St. N.W., Washington, D. C.
1907. Royer, B. Franklin, The Hall, R. D. 7, Chambersburg, Pa.*
1913. de Schweinitz, George L., 85 E. Broad St., Bethlehem, Pa.*
1908. Shoemaker, Harlan, 1930 Wilshire Blvd., Los Angeles, Cal.*
1932. Siegel, Alvin E., Medical Arts Building, 553 Walnut St., Macon, Ga.[5]
1934. Stewart, Sloan G., Pacific and N. Carolina Aves., Atlantic City, N. J.[5]
1900. Swan, John M., 457 Park Ave., Rochester, N. Y.*
1913. Vail, William Penn, Blairstown, N. J.*
1897. Veasey, Clarence A., Paulson Bldg., Spokane, Wash.*

Honorary Fellows

Limited to Fifty, of Whom Twenty May Be Foreigners

American

ELECTED

1909. Crile, George W., m.d., Cleveland Clinic, Euclid Ave. at E. Ninety-third St., Cleveland, O.

1916. Estes, Wm. L., a.m., m.d., sc.d., Surgeon Emeritus, St. Lukes Hospital. Union Bank Building, Bethlehem, Pa.

1912. McCaw, Brig.-Gen. Walter D., m.d., Assistant Surgeon-General, U. S. A., retired, Woodstock, Ulster Co., N. Y.

1906. Mayo, William James, a.m., m.d., d.sc., ll.d., Surgeon and Chief of Staff to Mayo Clinic. Mayo Clinic, Rochester, Minn.

1917. Miner, Charles H., m.d., 264 S. Franklin St., Wilkes-Barre, Pa.

1936. Richards, Alfred Newton, ph.d., sc.d., m.d. (hon.), School of Medicine, University of Penna., Phila.

1937. Zinsser, Hans, a.m., m.d., d.sc., Professor of Bacteriology and Immunology, Harvard Medical School. Harvard Medical School, Boston, Mass.

Foreign

1928. Archibald, Edward, m.d., McGill University, Montreal, Canada.

1937. Dale, Sir Henry Hallett, c.b.e., f.r.s., m.a., m.d., f.r.c.p., Director National Institute for Medical Research, Hamstead, Eng. Mt. Vernon House, N.W.3, Hamstead, London.

1924. Hopkins, Sir F. Gowland, m.d., Biochemical Department, University of Cambridge, Cambridge, England.

1922. McCarrison, Sir Robert, kt., c.i.e., m.d., d.sc., ll.d., f.r.c.p., Major-General, Indian Medical Service (retired). 18 Linton Rd., Oxford, England.

1928. Rolleston, Sir Humphrey, bart., g.c.v.o., k.c.b., m.d., d.c.l. (*Durh.*), ll.d., d.sc., Martins, Haslemere, Surrey, England.

Necrological List

Fellows

Courtland Y. White, M.D., January 14, 1938
Michael A. Burns, M.D., March 7, 1938
Edward Martin, M.D., March 17, 1938
William F. Moore, M.D., April 25, 1938
R. Tait McKenzie, M.D., April 28, 1938
Ross V. Patterson, M.D., May 2, 1938
Lawrence F. Flick, M.D., July 7, 1938
George E. de Schweinitz, M.D., August 22, 1938
John C. Heisler, M.D., September 9, 1938
J. Norman Henry, M.D., October 4, 1938
John H. Girvin, M.D., October 23, 1938
Addinell Hewson, M.D., October 27, 1938
Charles R. Baum,* M.D., October 27, 1938
Philip S. Stout, M.D., November 3, 1938
Floyd E. Keene, M.D., November 15, 1938
George W. Pfromm, M.D., December 4, 1938
Benjamin F. Baer, Jr., M.D., December 19, 1938
Frederick J. Kalteyer, M.D., December 20, 1938

* Non-resident.

Index to Volume 6

Acidosis, diabetic, not influenced by sodium succinate (*abstract*), 120
Adams-Stokes syndrome, with special reference to the electrocardigram during seizures (*abstract*), 336
Addison's disease, Effect of water restriction in (*abstract*), 335
Adrenal insufficiency, observations on [Wilder], 79
Air-borne infections, Immunity to (*abstract*), 42
——, Masks and prevention of (*abstract*), 41
——, Prevention and control of (*abstract*), 44
Albright, Fuller, 337
Allergic purpura (*abstract*), 37
Allergy, food, Value of leucopenic index in determining (*abstract*), 123
Allergy in the urinary tract (*abstract*), 38
Anatomical fugitive sheets, 341
Anders Lecture [Swift & Cohn], 197
Aneurysm, abdominal aortic (*abstract*), 242
Anthracosilicosis, Tuberculosis and heart disease in (*abstract*), 121

Babbitt, James A., 46
Batson, Oscar V., 46
Baum, Charles, 357
Beardwood, Joseph T., Jr., 35
Bechet, Paul E., 47
Behrend, Albert (*abstract*), 244
Behrend, Moses (*abstract*), 244
Bergey, D. H., *Memoir of*, 249
Bernstein, Mitchell (*abstract*), 118
Best, Charles H., Hatfield Lecture (*title*), 334
Bett, Walter Reginald, 47
Bettag, Otto L. (*abstract*), 121
Bleeding, abnormal uterine, in typhoid fever (*abstract*), 119
Boyd, William, Mütter Lecture, 317
Bronchial carcinoma, reasons for the recent increase of [Boyd], 317
Bronk, Detlev, Mitchell Oration, 102
Burr, Charles W., *Portrait of*, 2

Calder, Duncan G. (*abstract*), 119
Campbell, C. Macfie, College Lecture, 16
Canfield, Norton, 338
Carcinoma, bronchial, Reasons for the recent increase of [Boyd], 317
Carcinoma, Diabetes as symptom of (*abstract*), 118
Cardiac diseases, infectious & non-infectious, in relation to public health [Swift & Cohn], 179
Carpenter, John T., 344
Census of incunabula, 159
Chance, Burton, 46, (*abstract*), 245
Charles II, Manuscripts bearing on death of [Krumbhaar], 51
Charr, Robert (*abstract*), 121
Cholangeitis lenta, so-called (*abstract*), 39
Clark, Eliot R., 337
Clarke, J. A., Jr. (*abstract*), 37
Clendening, Logan, 75
Clubbing, congenital, of fingers and toes (*abstract*), 122
Coates, George M., 46
Cohen, Archibald C. (*abstract*), 121
Cohen, Myer Solis- (*abstract*), 35
Cohn, Alfred E., Anders Lecture, 197
College Collections, Report of Committee on, 376

Committees of the College, list of, 388
Compensations at 70 [McKenzie], 271
Cottrell, James E. (*abstract*), 243
Cowan, Alfred, 247

Daland, Judson, *Memoir of*, 48
Daugherty, Earl A., 35
Davis, Warren B., 45, 46 (*bis*)
Diabetes insipidus as symptom of metastatic carcinoma (*abstract*), 118
Diabetes, treatment of acute complications (*abstract*), 243
Diabetic acidosis not influenced by sodium succinate (*abstract*), 120
Donaldson, H. H., *Presentation of portrait-medallion of*, [McKenzie], 73
Drinker, Philip (*abstract*), 41
Duncan, Garfield G., 121; (*abstract*), 243
Dwarfism, treatment with pituitary hormone (*abstract*), 243

Edwards, H. R., 339
Ellis, Van M., 338
Embolic phenomena in subacute endocarditis (*abstract*), 120
Emotional factors in health & disease [Campbell], 16
Endocarditis, subacute (*abstract*), 120

Fellows, lists of: Resident, 392; Nonresident, 415; Honorary, 417; Recently deceased, 418
Fetter, Ferdinand (*abstract*), 119
Fishback, David B. (*abstract*), 118
Friedberg, Charles K., 47
Friends of the Library, address before [Shryock], 282
Fugitive sheets, 341
General Medicine, Section on, 35, 118, 242, 335
Giant, Mütter American, [McFarland], 148
Gibson, Glen G., 124
Goldblatt, Harry, Newbold Lecture, 5
Gordon, William, 46
Gundersen, Trygve, 45
Guttmacher, Manfred S., 245

Hadden, Samuel B., 338 (*footnote 1*)
Harveiana, Presentation of, [Krumbhaar], 75
Hatfield Lectures, Longcope (*title*), 334; Best (*title*), 334
Hayward, Graham W., 121
Heed, Charles R., 45
Heisler, John C., 356
Hewson, Addinell, 46
Hubert, Louis, 46
Hughes, Boland, 37
Hypertension, essential, Observations on pathogenesis of, [Goldblatt], 5

Immunity to air-borne infections (*abstract*), 42
Incunabula, Census of, 159
Infections, air-borne (*abstracts*), 41, 42, 44
——, respiratory, New filtrable virus associated with, 329

Jackson, Chevalier L., 47
Jackson, Edward, 247
Jameson, Edwin M., 47
Jones, Harold W. (*abstract*), 123
Jones, Marvin F., 46
Jump, Henry D. (*abstract*), 242

Kalteyer, Frederick J., 358
Kelly, Herbert T., 248
Kenney, Athol S., 329
Klauder, Joseph V., 45
Klein, Thomas, 124
Kleinbart, Morris (*abstract*), 122
Knox, Andrew, 45
Kolmer, John A., 46
Kramer, Rudolph, 46

Krumbhaar, E. B., 47, 51, 75, 245, 260

Landis, H. R. M., *Memoir of*, 254
Leaman, William G. (*abstract*), 242
Lectures, schedules of, (1938), 334; (1938–39), 194
Lees, H. D., 339
Lempert, Julius, 338
Leopold, Simon S., 37
Leucopenic index, value in determining food allergy (*abstract*), 123
Libman, Emanuel, 47
Library Committee, Report of, 364
Long, Charles-Francis, 339
Lucké, Balduin, 337
Lukens, F. D. W. (*abstract*), 120, 337
Lukens, Robert M., 46

McCarthy, D. J., 254
McDaniel, W. B., 2d, 60, 159 (Census of Incunabula), 341
McDonald, Robb, 338
McFarland, Joseph, 148, 249
McKenzie, R. Tait, 73, 260 (*Memoir of*), 271
Martin, Edward, *Memoir of*, 352
Masks and air-borne infections (*abstract*), 41
Mayo, William J., 352
Mazer, Sylvia A., 124
Mecholyl iontophoresis in vascular disorders (*abstract*), 36
Medical History, Section on: Officers of, 390; Programs & abstracts, 46, 245, 337
Medical Library, value of, to social historians, [Shryock], 282
Memoirs of D. H. Bergey, 249; Judson Daland, 48; George E. de Schweinitz, 344; H. R. M. Landis, 254; R. Tait McKenzie, 271; Edward Martin, 352; Richard C. Norris, 256
Miller, Malcolm W. (*abstract*), 38
Mitchell Oration [Bronk], 102
Montgomery, Hugh (*abstract*), 36
Moore, Matthew T. (*abstract*), 118
Moore, William F., 355
Morgan, A. C., 48
Mütter American Giant [McFarland], 148
Mütter Lecture [Boyd], 317
Mütter Museum, Report of Committee on, 375
Mullen, Carroll R., (vice S. B. Hadden), 247, 338 (*footnote 1*)
Muller, George P., *President's address*, 355
Musser, John H., 248

Nervous function, cellular organization of [Bronk], 102
Newbold Lectures: Goldblatt, 5; Wilder, 79
Nicholson, William R., 256
Norris, Richard C., *Memoir of*, 256

Obstetrical Society of Phila., history of, [Scheffey], 125, 292
Officers & Committees, list of, 388
Olsho, Sidney L., 45
Ophthalmology, Section on: Officers of, 390; Programs of, 45, 124, 247, 338
Otolaryngology, Section on: Officers of, 390; Programs of, 45, 124, 248, 338

Parker, Frank C., 124
Patterson, Ross V., 356
Pepper, O. H. Perry (*abstract*), 39
Pettit, Horace, 338
Pfromm, George W., 357
Pituitary growth hormone in dwarfism (*abstract*), 243
Pneumonectomy, total (*abstract*), 244
Porter, Charles T., 248
President's address [G. P. Muller], 355
Presidents of the College, List of, 387

Prize Committees and Trustees, 389
Psychoanalysis, should it be purged? [Strecker], 228
Public lecture (author and title), 334
Purpura, allergic (*abstract*), 37

Ravdin, I. S., 337
Reber, Jacob, 247
Reese, Algernon B., 45
Reimann, Hobart A., 335
Respiratory infections, New filtrable virus associated with, 329
Riesman, David, 245
Robertson, Wm. Egbert, 46, 124
Rümelin, J., "1613" *Cataptron of*, [McDaniel], 60
Rynes, Samuel E. (*abstract*), 37

Scheffey, Lewis C., 125, 292
Scheie, Harold G., 247
de Schweinitz, George E., *Memoir of*, 344
Sections, Programs and Abstracts of: General Medicine, 35, 118, 242, 335; Medical History, 46, 245, 337; Ophthalmology, 45, 124, 247, 338; Otolaryngology, 45, 124, 248, 338; Public Health, 41, 124, 248, 338
Shannon, C. E. G., 124
Shaw, Dorothy R., 329
Shryock, Richard H., 282
Skillern, Samuel R., 248
Smith, Austin T., 45
Sodium succinate, failure to influence diabetic acidosis (*abstract*), 120
Spaeth, Edmund B., 45, 124
Steinfield, Edward (*abstract*), 35
Stengel, Alfred, 334
Stokes, Joseph, Jr. (*abstract*), 42, 329
Stout, Philip S., 357
Strecker, Edward A., 228
Stroud, William D., 35
Sulfanilamide, effect upon bactericidal activity of blood against streptococci (*abstract*), 35
Sunderman, F. William, 335
Swift, Homer F., Anders Lecture, 197

Tassman, I. S., 45
Taylor, The "Chevalier" John (*abstract*), 245
Terrell, A. W., Jr. (*abstract*), 120
Toland, J. Hart, 339
Torrey, Robert G., 336
Treasurer's Reports, 378
Tuberculosis, pulmonary, and heart disease in anthracosilicosis (*abstract*), 121
Tucker, Gabriel, 46, 248
Typhoid fever, Abnormal uterine bleeding in (*abstract*), 119

Uhle, Charles A. W. (*abstract*), 38
Ullom, Josephus T. (*abstract*), 120
Urinary tract, allergy in (*abstract*), 38
Uterine bleeding, abnormal, in typhoid fever (*abstract*), 119

Vascular disorders, Mecholyl in (*abstract*), 36
Virus, New Filtrable, associated with respiratory infections [Stokes, Kenney, and Shaw], 329

Weinstein, Sydney, 35
Weiss, Edward (*abstract*), 122
Wells, William F. (*abstract*), 44
White, Courtland Y., 355
White, Francis W., 46
Wilder, Russell M., Newbold Lecture, 79
Willson, Donald M., 335
Wofford, Charles P. (*abstract*), 119
Wood, Horatio C., 46

Young, Hugh Hampton, 47

Zentmayer, William, 45

SCHEDULED FOR PUBLICATION IN THE NEXT NUMBER OF THE TRANSACTIONS & STUDIES ARE THE FOLLOWING:

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The Cellular Organization of Nervous Function — Detlev W. Bronk

Recent Clinical and Experimental Observations in Adrenal Insufficiency — Russell M. Wilder

Historical Communications

The Early Years of the Philadelphia Obstetrical Society (*Part I*) — Lewis C. Scheffey

Notes on the Mütter American Giant — Joseph McFarland

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